PRICE 10 CENTS BY THE YEAR $1.00

THE RAILROAD MAN'S MAGAZINE

HOBO HEROES who have SAVED TRAINS

NOVEMBER

THE FRANK A MUNSEY COMPANY NEW YORK AND LONDON

$200.00 In Six Months From 20 Hens

TO the average poultryman that would seem impossible, and when we tell you that we have actually done a $500.00 Poultry business with 20 hens on a corner in the city garden 30 feet wide by 40 feet long we are simply stating facts. **It would not be possible to get such returns** by any one of the systems of poultry keeping recommended and practiced by the American people, still it is an easy matter when the new **PHILO SYSTEM** is adopted.

The Philo System Is Unlike All Other Ways of Keeping Poultry

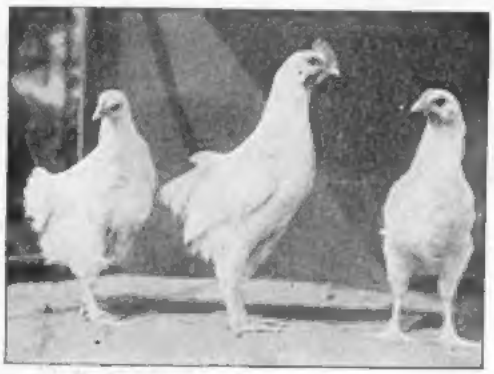
and in many respects is just the reverse, accomplishing things in poultry work that have always been considered impossible, and getting unheard of results that are hard to believe without seeing; however, the facts remain the same and we can prove to you every word of the above statement.

The New System Covers All Branches of the Work Necessary for Success

from selecting the breeders to marketing the product. It tells how to get eggs that will hatch, how to hatch nearly every egg and how to raise nearly all the chicks hatched. It gives complete plans in detail how to make everything necessary to run the business and at less than half the cost required to handle the poultry business in any other manner. There is nothing complicated about the work, and any man or woman that can handle a saw and hammer can do the work.

Two Pound Broilers in Eight Weeks

are raised in a space of less than a square foot to the broiler without any loss, and the broilers are of the very best quality, bringing here three cents per pound above the highest market price.



Our Six Months Old Pullets Are Laying At the Rate of 24 Eggs Each Per Month,

in a space of two square feet for each bird. No green cut bone of any description is fed, and the food used is inexpensive as compared with food others are using.

Our new book, the **Philo System of Progressive Poultry Keeping**, gives full particulars regarding these wonderful discoveries with simple, easy to understand directions that are right to the point, and 15 pages of illustrations showing all branches of the work from start to finish.

Don't Let the Chicks Die in the Shell

One of our secrets of success is to save all the chickens that are fully developed at hatching time, whether they can crack the shell or not. It is a simple trick and believed to be the secret of the Ancient Egyptians and Chinese which enabled them to sell the chicks at 10 cents a dozen.

Chicken Feed at 15 Cents a Bushel

Our book tells how to make the best green food with but little trouble and have a good supply any day in the year, winter or summer. It is just as impossible to get a large egg yield without green food as it is to keep a cow without hay or fodder.

Our New Brooder Saves Two Cents on Each Chicken

No lamp required. No danger of chilling, overheating or burning up the chickens as with brooders using lamps or any kind of fire. They also keep all lice off the chickens automatically or kill any that may be on when placed in the brooder. Our book gives full plans and the right to make and use them. One can be easily made in an hour at a cost of 25 to 50 cents.

A FEW TESTIMONIALS

Your system of poultry keeping should appeal to all poultrymen. The advantages of your system are many, and the quality of the large flock of poultry you have raised on your city lot is the best evidence of its success.

Geo. L. Harding, Binghamton, N.Y.

Valley Falls, N.Y., Sept. 5, 1907.

It was my privilege to spend a week in Elmira during August, during which time I saw the practical working of the Philo System of Poultry Keeping, and was surprised at the results accomplished in a small corner of a city yard. "Seeing is believing," they say, and if I had not seen, it would have been hard to believe that such results could have followed so small an outlay of space, time and money.

(Rev.) W. W. Cox.

Windsor, Vt.,
March 8, 1908.

I consider the one dollar I invested in the Philo System, Poultry Review and American Poultry Advocate, the best investment for the money I ever made.

Robert L. Patrick.

Jacobs Creek, Pa.

I received the Philo System Book mailed to my home address, Beechtree, Pa. I am highly pleased with it, and am anxious to spread the good news as far as I can. I am a preacher of the gospel engaged by the Baptist Association to do Evangelistic work. I am on the road all the time, have about 14 days in each town. I am very much interested in the hen and will do all I can to help the other fellow to know how, and to spread the good tidings received in the Philo System. (Rev.) F. B. Williams.

Special Introductory Offer By Special Arrangement we are able to give for only $1.00 the book, with the right to use all plans.

One year's subscription to Poultry Review—A monthly paper for utility breeders. One year's subscription to the American Poultry Advocate.

Upon receipt of $1.00 you will get the book by return mail and your subscriptions will start at once.

Copy of the Philo System book and a year's subscription to Poultry Review and the American Poultry Advocate, all for $1.00

AMERICAN POULTRY ADVOCATE, 280 Hogan Block, Syracuse, N.Y.

$125 to $300 a Month

Send the coupon below and find out about the opportunities in the profession of Signal Engineering. *Big salaries are being paid* —$125 to $300 a month is an ordinary salary for the man who has the proper training. You can get just this kind of training right in your own home—during your spare time. Men are needed. Send the coupon for the book that tells you all about it. You owe it to yourself to find out about the opportunities that are offered to you. Send the coupon today—now.

Be a Signal Engineer!

Be the man who gets the fat pay envelope. The profession of Signal Engineering is only in its infancy. There are thousands of miles of block signals to be installed. Signal Engineers, supervisors, inspectors and foremen are required to superintend this installation. Hundreds of maintainers and battery men are needed to maintain the systems already in use.

Your duties may take you from coast to coast. Railroad men are always in a fortunate position to travel and see the world because free transportation is liberally awarded. You can accept a position where you will be located steadily at one place, if you prefer—the position of authority—the high place and the fat pay envelope may be yours. Send the coupon today for the free Signal Book.

Two Big Outfits FREE
Complete Signal Engineer's Outfit and Complete Draftsman's Outfit given away absolutely free to each student

Men Are Needed

The profession of Signal Engineering is calling to ambitious men. Our ranks are not overcrowded. **There are opportunities—golden ones, awaiting the men who answer the call.** Block signal systems are no longer in the experimental stage. All over the country they are being installed. Some States have legislated to compel the railroads to install systems immediately. In our profession you will have the chance you have been looking for. **We are calling you.** Send coupon today for big Free Signal Book and full details.

Send Coupon for Big New Book

Put your name and address on the coupon or on a letter or a postcard now, and send it to us. Absolutely no obligations of any kind. We will send you our big new Book absolutely free, and prepaid. Read about this fascinating profession. Read about the opportunities that await you. The book is free. Send the coupon for it now—it's the first step toward the realization of your ambition. Send your name and address at once.

Department of Signaling
Room 1097, 1810 Wilson Ave., Ravenswood Station, Chicago

Department of Signaling
Room 1097, 1810 Wilson Ave.
Ravenswood Station, Chicago

Gentlemen—Please send me absolutely free and prepaid your big new book on Signal Engineering. Also full particulars about your great special free outfit offer. It is distinctly understood that I assume no obligations of any kind.

Name.....

Address.....

Age..... Occupation.....

No Money In Advance

Only 50¢ in Ten Days

Smashing Rocker Bargain

Here is a striking example of the wonderful bargains offered by the House of Hartman—the mammoth $12,000,000 Home Furnishing Institution that is supplying the household needs of over 2,000,000 homes.

No other similar concern in America has such an enormous buying power—controls the entire output of as many factories—or is in a position to offer merchandise of the very highest quality at such low prices and on such easy terms.

HARTMAN Will Trust You

Let this Rocker, itself, convince you how great and wonderful a bargain it really is. Send no money—just the coupon—and we will ship it to you at once. Then decide for yourself whether or not you wish to keep it. If you do, pay only 50c in 10 days after it arrives—and the balance of our bargain price of only $4.97 at rate of only 50c per month. If you don't say it is the biggest Rocker bargain you ever saw, just return it at the end of 10 days at our expense. You won't be out a cent. Send coupon today—order by number.

Rocker No. MK230. Frame strongly built of solid oak, with beautifully embossed carving on front posts, back panel strip and side wings. Handsome golden finish. This Rocker is large and roomy having a seat upholstered in guaranteed Spanish imitation leather. Back divided into two panels by richly carved strip. Seat measures 19x19 inches; height of back from floor 39 inches. Seat supported by four heavy steel springs. A wonderful bargain at our low price of only $4.97—no money in advance—50c in 10 days; balance 50c monthly.

Order Direct From This Ad

Not a bit of risk on your part—you don't send a cent in advance

Wonderful Steel Range Offer

You couldn't buy as handsome, as durable, as economical, or as dependable a cooking and baking range as Hartman's "Capital" Regent, at anywhere near our price. It's the last word in steel range construction—built for satisfactory service. The minute you see it you will marvel at its many attractive features as well as beautiful appearance. Start either a coal or wood fire in it; cook and bake with it, and you will be so delighted with results that you couldn't be induced to have it leave your kitchen. That's the way we want you to test it—in actual use—at our risk. We don't ask you to send a cent in advance; give security, or even promise to buy. Mail coupon and we will ship you the range. If perfectly satisfied, pay only 50c in 10 days after it arrives and balance of our special bargain price ($22.95 without reservoir, $1.75 per month; or $28.95 with 12 qt. reservoir, $2 per month).

Only 50c In 10 Days

No. MK232 Without Reservoir or No. MK233 With Reservoir.

"Capital" Regent Steel Range complete with high warming closet with full length shelf. Duplex grates for burning wood or coal—large pouch feed for coal. Oven 18 in. wide, 19 in. deep, 11 in. high, with wire oven rack. Spring balanced, drop type oven door forming shelf when lowered. Body of polished blue steel. Firebox 17½x8x6 in. Cooking top, without reservoir 26x34 in.; with reservoir, 27x40 in. All nickled parts are well plated.

Send for FREE Bargain Catalog

containing thousands of wonderful bargains in Home Furnishings. Only one of the above bargains will be sent to a family, but, when you get this wonderful Bargain Book, you may order as many items as you like; all at bed-rock prices on the HARTMAN Easy Credit Plan. Mail coupon today.

Prices Include New Style High Closet

HARTMAN FURNITURE AND CARPET CO.,
3922 Wentworth Avenue, CHICAGO, ILL.

HARTMAN FURN. AND CARPET CO.
3922 Wentworth Ave., Chicago, Ill.

Send me article No.....
(Fill in name and number)

If I keep it, I will pay 50c in 10 days and balance in small monthly payments as per terms and prices quoted above.

Name.....

Address.....

88

If only catalog is wanted, place an X in this ☐

FB

RAILROAD MAN'S MAGAZINE

CONTENTS FOR OCTOBER, 1916

The entire contents of this magazine are protected by copyright, and must not be reprinted without the publishers' permission.

FICTION

THE BAGGAGE COACH AHEAD. (Illustrated) . . . . . Frank Condon 209
HONK AND HORACE. (Illustrated) . . . . . Emmet F. Harte . . . 231
THE COMEDY IN THE SLEEPER . . . . . William H. Seymour . . 285
TALES BY JONES THE BOOMER . . . . . J. W. Earp 303
THE END OF ENGINE 10 . . . . . John H. Burns 338
MR. TOM HILL ASSISTS. (A Detective Novelette Complete) . . Charles Wesley Sanders . 348

FEATURES

BIG RAILROADING. No. 4. How Science Boosts the Railroad's Revenues by Seeing That the Company Gets What It Has Paid For. (Illustrated) Charles Frederick Carter . 193
BEFORE THE TRAINS COME . . . . . George W. Foster . . . 220
OPERATOR'S "FIST." (Illustrated) . . . . . Donald McNicol . . . 224
OLD TIMES ON G., H. AND S. A. . . . . "J. E. M." 241
TALES FROM THE KNIGHTS OF THE RAILROAD ROUND-TABLE:
The Bald Wood-Burner . . . . . Charles S. Given . . . 252
The Goat-Getter . . . . . P. G. Estee 254
A Double-Barreled Wreck . . . . . Floyd T. Wood . . . 256
The Vanishing Headlight . . . . . F. B. Lovett 258
What Made Them Gray . . . . . Frank Kavanaugh . . . 260
AUTOS THAT RUN ON RAILS. (Illustrated) . . . . . C. H. Claudy 266
THE COUNTRY STATION-AGENT. (Illustrated) . . . . . J. E. Smith 275
R. R. EDUCATION ON WHEELS. (Illustrated) . . . . . Frank M. O'Brien . . 310
UNCLE SAM FOR SAFETY FIRST. (Illustrated) . . . . . Olin L. Lyman . . . 326
R. R. IS AN INSURANCE POLICY . . . . . Waldon Fawcett . . . 341

DEPARTMENTS

BY THE LIGHT OF THE LANTERN 291
TELEGRAPHIC AND TELEPHONIC 297
THE SUNNY SIDE OF THE TRACK 301
HELP FOR MEN WHO HELP THEMSELVES. No. 74. The Story of the Passenger-Train. In Five Parts. Part One—What the Passenger Never Sees . . . . . Claude Washington . . 318
WITH THE INVENTORS . . . . . Lester L. Sargent . . . 334
ON THE EDITORIAL CARPET 379

MISCELLANY

FROGS 218
CAR VICTIMS THAT NEVER SUE. (Illustrated) . 219
BRASS-POUNDER IN CONGRESS. (Illustrated) . 230
"30" FOR W. L. WAUGH. (Illustrated) 249
THE SILK-TRAIN. (Poem). Lydia M. Dunham O'Neil 250
FIRST LOCOMOTIVE WEST OF CHICAGO. (Illustration) 251
MT. TAMALPAIS "BOWKNOT,"—WORLD'S CROOKEDEST ROAD. (Illustrated) 264
WORLD'S GREATEST PIERS SUPPORT THIS BRIDGE. (Illustration) 274
WHAT A R. R. TICKET COVERS 284
THIRTY YEARS A DYNAMITER. (Illustrated) . 290
YOU WITH THER FOOLISH CLOTHES. (Poem) Jack Hyatt, Jr. 309
"13" DIDN'T JINX THIS HOG. (Illustrated) . . 317
WISDOM and PHILOSOPHY 208, 217, 240, 273, 289, 325
THE OLD MOGUL. (Poem) . . Olin L. Lyman 333
BRANNIGAN'S CAR. (Poem) . Owen Hugh O'Neil 337
THE TRAIN BUTCHER. (Poem) . Richard Whitman 343
RAILROAD AS PUBLIC RESCUER. (Illustrated) . 344
RAILROAD CRANE THAT WORKS. (Illustrated) 347
THE RAILROADER'S MAIL-BAG 380
SONGS BY BARDS OF THE RAIL 384

THE FRANK A. MUNSEY COMPANY, 8 West Fortieth Street, New York, and Temple House, Temple Avenue, E. C., London
FRANK A. MUNSEY, President RICHARD H. TITHERINGTON, Secretary CHRISTOPHER H. POPE, Treasurer
Single copies, 10 cents. By the year, $1.00 to United States, its dependencies, Mexico and Cuba; $1.50 to Canada, and $2.00 to Foreign Countries. Remittances should be made by check, express money order or postal money order. Currency should not be sent unless registered
ISSUED MONTHLY. COPYRIGHT, 1916, BY THE FRANK A. MUNSEY COMPANY

ENTERED AT THE NEW YORK POST-OFFICE AS SECOND-CLASS MAIL MATTER—COPYRIGHTED IN GREAT BRITAIN

FC

Classified Advertising

The Purpose of this Department is to put the reader in touch immediately with the newest needfuls for the home, office, farm, or person; to offer, or seek, an unusual business opportunity, or to suggest a service that may be performed satisfactorily through correspondence. It will pay a housewife or business man equally well to read these advertisements carefully.

"A New Force In Business" is a booklet that tells how to advertise successfully in the Classified Department of the Munsey Magazines. Mailed anywhere on request.

Classified Advertising Rates in The Munsey Magazines

	LINE RATE	
Munsey's Magazine	$2.00	Special combination line rate $4.40 less 2 per cent cash discount.
The Argosy	1.30	
Railroad Man's Magazine	.80	
All-Story Weekly	.60	
	$4.70	

Nov. Railroad Man's Magazine Forms Close Sept. 12th

AGENTS & SALESMEN WANTED

AGENTS—MARVELOUS MERIT WINS; SCIENCE TRIUMPHS. Eight men order 47,620 packages first 16 days; largest, most reputable Corporation Manufacturing Clothes Washing Marvel starts you; backs you; furnishes free beautiful motion picture slides—**Your Name** appearing. Kalomite is **Original;** Supreme; Makes Clothes **Snow White Without Rubbing,** washboards or machines; Kalomite is **Not** a powder; not just paraffin wax. $1000 guarantee; experience unnecessary; credit granted; protective certificate issued. Wonderful **Repeat Order Opportunity.** Write **Today** for extraordinary proof. Equitable Corporation, Dept. 401, 215 Superior, Chicago.

$50 A WEEK UP. ALL THE FREE CLOTHES YOU WANT TO WEAR simply to advertise us. Write today for self-measuring blanks, style chart, big book of samples, etc. Send no money. A postal card brings all. We pay expressage on everything. American Woolen Mills Co., Dept. 1003, Chicago.

HERE'S YOUR CHANCE TO START a permanent and profitable mail order business of your own. No experience necessary. No capital needed. Big Profits. Write for particulars. The R. Dean Co., 244 West 41st Street, New York City.

AGENTS: YOUR OPPORTUNITY IS RIGHT HERE to establish a business of your own. We finance you on the biggest money making line of Aluminum Cooking Utensils and Specialties in America. We are original Manufacturers of Aluminum Ware. Our sales plan enables you to call on customers by appointment only. Our men are cleaning up $40.00 to $100.00 a week. Free Sales Course teaches you. Big Agents Monthly Magazine free. If you are strong enough to stand prosperity, send us a postal today and secure your choice of territory. Div. W. Y., American Aluminum Mfg. Co., Lemont, Ill.

MAKE 100% PROFIT ON QUICK SELLING NEW $5.00 PHONOGRAPH. A real phonograph. Best low priced machine on market. Plays all disc records. Write for proposition and exclusive territory. Strobel & Wilken Co., 59 W. 23rd St., New York.

RAILROAD MEN ADD MANY DOLLARS TO THEIR SALARIES during spare time selling Transparent Handled Novelty Knives with name, address, photo, lodge emblems, etc., showing under the handle. Lightning sellers. We show you how. Also want agents who can give full time. Big profits guaranteed. Novelty Cutlery Co., 111 Bar Street, Canton, Ohio.

AGENTS—WITH SELLING EXPERIENCE—To Sell Direct to consumer made-to-measure suits and overcoats, $12.50 and $16.50. If you want an independent business with Big Money, answer at once before territory is taken. Outfits furnished. Midland Tailoring Co., Dept. A, 16-19 S. Fifth Ave., Chicago, Ill.

$150.00 SALARY FOR 60 DAYS' WORK PAID WOMAN OR MAN in each town to distribute **Free** circulars, and take orders for White Ribbon Concentrated Flavoring. J. S. Ziegler Co., 98 E. Harrison Street, Chicago.

ENERGETIC MEN MAKE BIG MONEY SELLING SLICK-SHINE in every home, store, garage and through sub-agents. Duplicate orders come easy. Address Slick-Shine Co., Newark, N. J.

SALESMEN WANTED.—BEST PUNCH BOARD DEALS ON EARTH. Brand New Consignment. $5.00 commission on order and repeats. Old reliable. Grove Mfg. Co., 2562 Cottage Grove, Chicago.

AGENTS—500% PROFIT. FREE SAMPLE GOLD AND Silver Sign Letters for store fronts and office windows. Anyone can put on. Big demand everywhere. Write today for liberal offer to agents. Metallic Letter Co., 410 N. Clark St., Chicago.

Armstrong Earned $67.50 First Day selling our new business necessity. Retails $5.00 to $30.00. Agents profit 150%. Buyer satisfied or money back. No competition. Exclusive territory. Free sample. Sayers Co., 421 Wainwright, St. Louis, Mo.

WE WILL PAY YOU $120.00 for congenial work in your own community, 60 days or less. Man or woman. No capital required. Opportunity for promotion. Spare time may be used. Full particulars free. International Press, 435 Winston Bldg., Phila., Pa.

WANTED—RELIABLE MEN AND WOMEN to place our **EGGINE** in stores and appoint sub-agents. Takes the place of eggs in baking and cooking at less than 9c a dozen. Chas. Morrissey Co., R-4417-19 Madison Street, Chicago, Ill.

AGENTS TO TRAVEL BY AUTOMOBILE to introduce our 250 fast selling, popular priced household necessities. The greatest line on earth. Make $10 a day. Complete outfit and automobile furnished free to workers. Write today for exclusive territory. American Products Co., 9810 3rd St., Cincinnati, O.

YOUNG MAN, would you accept a tailor-made suit just for showing it to your friends? If you live in town smaller than 5000, or R. F. D., write Banner Tailoring Co., Dept. 390, Chicago, and get beautiful samples, style and a wonderful offer.

WE START YOU IN BUSINESS, FURNISHING EVERYTHING; men and women, $30.00 to $200.00 weekly operating our "New System Specialty Candy Factories," home or small room anywhere. No canvassing. Opportunity lifetime. Booklet free. Ragsdale Co., Drawer 92, East Orange, N. J.

AGENTS & SALESMEN WANTED

EVERY HOME ON FARM, IN SMALL TOWN OR SUBURBS needs and will buy the wonderful Aladdin kerosene (coal-oil) Mantle Lamp. Five times as bright as electric. Tested and recommended by Government and thirty-four leading Universities. Awarded Gold Medal. One farmer cleared over $500 in six weeks. Hundreds with rigs or autos earning $100 to $300 per month. **No capital required; we furnish goods on time** to reliable men. Write quick for sample lamp for free trial, distributor's proposition and secure appointment in exclusive territory. Mantle Lamp Co., 604 Aladdin Building, Chicago, Ill.

SMOKER WANTED.—WE WANT SILENT SALESMEN who will smoke a pipe and get paid for it. Send no money, just write for particulars. M. H. Putnam, 807 West 51st Street, New York City.

SWELL SUIT FREE FOR 2 HOURS' WORK. Show it to your friends and make $5.00 an hour in your spare time. We show how. Costs nothing to try. Write quick for measure blank and our handy sample outfit. All Free. We deliver everything free. Look into this. Paragon Tailoring Co., Dept. 1003, Chicago.

AGENTS—COOPER MADE $314 LAST MONTH, $91 LAST WEEK, selling "Kantleak" Raincoats. New proposition. We deliver and collect. Sample coat Free. Comer Mfg. Co., 107 Owen Street, Dayton, Ohio.

MAN WANTED AS EXCLUSIVE AGENT. We manufacture six styles self-wringing Mops, for all purposes, including an absolutely new combination **Scrubbing Brushmop** that is self-wringing. Every woman wants this proven success. New inexperienced men make $9 per day. One man made $126 the second week, no investment. Send for catalogue and exclusive territory proposition that will make you independent. Hilker Mop Co., 2622 W. Grand Avenue, Chicago, Ill.

AGENTS—"EXCLUSIVE FEATURES" ARE WHAT MAKE EASY SALES. I can gain attention, close the sale and collect the money on six customers with the exclusive features of my non-alcoholic flavoring extracts while you are struggling with one customer on the old commonplace line of talk. So can you! Prove it! Write today. J. M. Pitkin Co., 629 R Street, Newark, New York.

SALESMEN capable of dealing with persons seeking unusually profitable investments are invited to write us at once. Opportunity exceptional; commission liberal; work permanent. Brookes, 10 Wall Street, New York.

IF YOU DON'T MAKE $6 DAILY SELL NOX WURK; absolute necessity; sells everywhere, repeats monthly; agents coining money with whirlwind selling plan. Exclusive virgin territory. Write quick for particulars and free sample. Bienenman Co., 1130 Transportation Building, Chicago.

AGENTS WANTED.—AGENTS MAKE 500 PER CENT PROFIT selling "Novelty Sign Cards." Merchants buy 10 to 100 on sight. 800 varieties. Catalogue Free. Sullivan Co., 1232 Van Buren Street, Chicago.

SALESMEN SELLING RESTAURANT, HOTEL, CAFE, Cigar, Pool, Drug, General Store Trade, can do big business with our new live pocket side line. All merchants towns 100,000 and under want it. $5.00 commission each sale. No collecting. No expense or risk to merchant. We take back all unsold goods. Canfield Mfg. Co., 208 Sigel Street, Chicago, Illinois.

1916'S SENSATION! 17 PIECE TOILET ARTICLE SET selling like blazes at $1, with $1 carving set **free!** Whirlwind stunt! Newcome made $18 one day! Write H. Pierce Company, 906 Lake Street, Chicago.

FREE SAMPLE—NOSPLASH WATER STRAINERS SELL THEMSELVES. No talking—experience unnecessary. Daily profits $5 upwards. Send 2c (mailing cost). S. D. B. Union Filter Co., New York.

BUSINESS OPPORTUNITIES

ADVERTISERS, MAIL DEALERS! OUR ADVERTISING GUIDE gives rates and circulation of 2,000 different publications, includes 30 mail order plans. Sent upon request. Dearborn Advertising Agency, 222 Franklin Building, Chicago.

TELEGRAPHY

LEARN TELEGRAPHY AT HOME IN HALF USUAL TIME. Trifling cost. Omnigraph Automatic Transmitter sends you Railroad or Wireless messages, at any speed, just as expert operator would. Morse and Continental Codes. Adopted by United States Government. Catalog free. Omnigraph Co., 39 W. Cortlandt Street, New York.

TELEGRAPHY—Morse and Wireless—also Station Agency taught. Graduates assisted. Cheap expense—easily learned. Largest school—established 42 years. Correspondence courses also. Catalog Free. Dodge's Institute, 9th Street, Valparaiso, Ind.

FD

HELP WANTED

WORK FOR UNCLE SAM. HE IS THE BEST EMPLOYER. Big pay, sure work, easy hours, long vacations, rapid advance. Thousands of jobs open this year. I will help you get one. Write for my big **Free Book** DY 31 today. Earl Hopkins, Washington, D. C.

"HIRE YOURSELF AS BOSS." Big corporation will back you in a money making Mail Order business selling Guaranteed quick sale goods. Start spare time at home or office. Valuable Instructions Free. Wm. J. Dick, Mgr., Dept. B-29, 20 W. Lake Street, Chicago, Ill.

MEN AND WOMEN WITH SPARE TIME CAN EARN A LOT OF EXTRA MONEY by our new and interesting advertising plan. No Investment. No Selling. No Soliciting. **Write today.** Crown Mfg. Co., Dept. B-9, 20 W. Lake St., Chicago.

WHY LOOK FOR A POSITION? START YOUR OWN profitable business without capital. Write John Hopkins, St. Paul Building, New York.

BE A DETECTIVE—EARN FROM $150.00 TO $300.00 PER MONTH. Travel over the world. Write C. T. Ludwig, 212 Westover Building, Kansas City, Mo.

THOUSANDS GOVERNMENT JOBS OPEN To Men—Women, $75 month. Steady work. Short hours. Common education sufficient. Write immediately for free list of positions now obtainable. Franklin Institute, Dept. N2, Rochester, N. Y.

I WILL START YOU EARNING $4.00 DAILY AT HOME in spare time, silvering mirrors. No capital. Any one can do the work. Send for free instructive booklet, giving plans of operation. G. F. Redmond, Dept. B, Boston, Mass.

GOVERNMENT POSITIONS PAY BIG MONEY. Examinations everywhere soon. Get prepared by former United States Civil Service Examiner. 64 page booklet free. Write today. Patterson Civil Service School, Box 1302, Rochester, N. Y.

WRITE NEWS ITEMS and Short Stories For Pay in spare time. Copyright book and plans free. Press Reporting Syndicate, 455, St. Louis, Mo.

LADY OR GENTLEMAN TO TRAVEL For Old-Established Firm. No canvassing. Staple line. $18 weekly, pursuant to contract. Expenses advanced. N. G. Nichols, Philadelphia, Pa., Pepper Building.

BE AN AUTOMOBILE EXPERT IN SIX WEEKS. Earn $75 to $250 a month. Our big book tells you how. Rahe's Automobile Training School, 519 E. 11th Street, Kansas City, Mo.

NO STRIKE: HONEST, SOBER MEN EVERYWHERE for firemen, brakemen, baggagemen. $120 monthly. Promotion. Experience unnecessary. 836 Railway Bureau, East St. Louis, Ills.

MOTION PICTURE PLAYS

Write Moving Picture Plays, $25 To $100 Each. Big demand. Previous experience or literary talent not required. **No correspondence course.** Send today for **free details** explaining everything. E-Z Scenario Co., R-M, 609 W. 127 St., New York City.

WRITE MOVING PICTURE PLAYS, SHORT STORIES, POEMS: $10 to $300 each. Constant demand. No correspondence course. Details free. Atlas Pub. Co., 331 Atlas Building, Cincinnati, Ohio.

PHOTOPLAYS WANTED BY 48 COMPANIES; $10 TO $500 EACH PAID FOR PLAYS. No correspondence course or experience needed; details sent free to beginners. Sell your ideas. Producers League, 330 Wainwright, St. Louis, Mo.

AUTHORS—MANUSCRIPTS

STORIES, POEMS, PLAYS, ETC., ARE WANTED FOR PUBLICATION. Good ideas bring big money. Submit Mss. or write Literary Bureau, 112, Hannibal, Mo.

WANTED—SHORT STORIES, ARTICLES, POEMS for new magazine. We pay on acceptance; offers submitted. Send prepaid with return postage. Handwritten Mss. acceptable. Cosmos Magazine, 942 Stewart Building, Washington, D. C.

TYPEWRITERS

TYPEWRITERS. ALL MAKES FACTORY REBUILT BY FAMOUS "YOUNG PROCESS." AS GOOD AS NEW, looks like new, wear like new, guaranteed like new. Our big business permits lowest cash prices. $10 and up. Also, machines rented—or sold on time. No matter what your needs are we can best serve you. Write and see—now. Young Typewriter Co., Dept. 1001, Chicago, Ill.

SEND FOR LIST NO. 7 OF TYPEWRITER BARGAINS, NEW AND REBUILT, cash, time or rent—10 days trial. American Typewriter Exchange, 14 N. Dearborn St., Chicago.

PRICES WRECKED, SAVE 10 TO 50% TODAY. All makes Typewriters. Nearly New and Rebuilt. $5.00 and up. Coronas and other portable machines. $10 up. Write for catalog No. 70. Beran Typewriter Co., 58 W. Wash. St., Dept. 25A, Chicago, Ill.

Startling Values In Typewriters, $10 to $15 and up. Rebuilt as good as new. All standard makes. Shipped on trial. Write for our "Easy Ownership" offer No. 89-A. Will positively save you money. Whitehead Typewriter Co., 180 N. LaSalle St., Chicago.

PATENT ATTORNEYS

PATENTS.—NO ATTORNEY FEES UNTIL PATENT ALLOWED. Send sketch for free search. Free Books. Fuller & Fuller, Washington, D. C.

PATENTS SECURED OR FEE RETURNED. ACTUAL SEARCH FREE. Send sketch or model. 1916 Edition 90-page patent book free. My patent sales service gets full value. George P. Kimmel, 226 Barrister Building, Washington, D. C.

ALL PATENTS SECURED THROUGH US WILL BE ADVERTISED free of charge in a monthly magazine. Send sketch or model to Alexander Denes, Registered Patent Attorney, 131 East 23rd Street, New York.

PATENT YOUR IDEAS—$9,000 OFFERED for certain inventions. Books, "How to Obtain a Patent," and "What to Invent," sent free. Send rough sketch for free report as to patentability. Manufacturers constantly writing us for patents we have obtained. We advertise your patent for sale at our expense. Established 20 years. Address Chandlee & Chandlee, Patent Attorneys, 826 F Street, Washington, D. C.

PATENTS—TRADE-MARKS. SEND FOR MY FREE BOOK "HOW TO GET THEM." It's full of information you should know. Joshua R. H. Potts, 8 S. Dearborn St., Chicago; 920 Chestnut St., Philadelphia; 805 G St., Washington.

PATENTS THAT PROTECT AND PAY. ADVICE AND BOOKS FREE. Highest references. Best results. Promptness assured. Send sketch or model for search. Watson E. Coleman, 624 F Street, Washington, D. C.

PATENTS—WRITE FOR HOW TO OBTAIN A PATENT, list of Patent Buyers, and Inventions Wanted. $1,000,000 in prizes offered for inventions. Send sketch for free opinion as to patentability. Our **Four Books** sent free upon request. Patents advertised **Free.** We assist inventors to sell their inventions. Victor J. Evans Co., Patent Attys., 755 Ninth, Washington, D. C.

PATENTS — TRADE-MARKS — COPYRIGHTS.— Protect your ideas. Information and advice free. Send sketch or model for search. J. R. Smith, 724 Bond Building, Washington, D. C.

IDEAS WANTED—Manufacturers are writing for patents procured through me. Three books with list hundreds of inventions wanted sent free. I help you market your invention. Advice free. R. B. Owen, 71 Owen Building, Washington, D. C.

STUDIES IN ENGLISH

STUDIES IN ENGLISH, used by the American Bankers Association, is a simplified text-book on Grammar, Composition and Speechmaking, reinforced by practical exercises to be written by students and corrected through comparison with a key containing the same exercises in proper form. Clearness and force as well as correctness are cultivated. Technicalities and superfluities are avoided. Such self-education, including text-book with exercises and key to exercises, costs $1. George B. Allen, 5 Nassau Street, New York City.

ADVERTISING

LEARN TO WRITE ADVERTISEMENTS—WILL Positively Show You by mail how you can earn $25 to $100 week. Biggest field in the world for you. Information free. Page-Davis Co., 216 Page Building, Chicago, Ill.

RAZORS & SAFETY RAZOR BLADES

SEND US YOUR DULL RAZOR BLADES. We will sharpen them to perfection for 30c per dozen. Straight razors honed 30c each. Satisfaction guaranteed. Prompt service. **Store Agents Wanted.** Keenedge Co., Dept. R. R., Chicago, Ill.

GAMES AND ENTERTAINMENTS

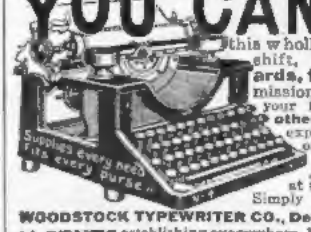
PLAYS, VAUDEVILLE SKETCHES, Monologues, Dialogues, Speakers, Minstrel Material, Jokes, Recitations, Tableaux, Drills, Entertainments, Make Up Goods. Large Catalog Free. T. S. Denison & Co., Dept. 45, Chicago.

REAL ESTATE—FARM LANDS

VIRGINIA

PROFITABLE LITTLE FARMS IN VALLEY OF VIRGINIA, 5 and 10 acre tracts, $250 and up. Good fruit and farming country. Send for literature now. F. H. LaBaume, Agr. Agt., N. & W. Ry., 324 Arcade Building, Roanoke, Va.

YOU CAN HAVE



this wholly visible (42) key single shift, **standard of standards, for your own** and commission besides, if you will show your friends wherein it **excells other $100 typewriters,** and explain to them our most liberal offer ever made on a strictly modern, single shift typewriter, and a **Woodstock** at that. By post card or letter, simply say, *"Mail Particulars."*

WOODSTOCK TYPEWRITER CO., Dept. O 211, Chicago, Illinois

AGENTS establishing everywhere. Many sales easily made. Self-selling Woodstock the latest great seller. Write for terms and territory. Act now and be ready for big business.

In answering any advertisement on this page it is desirable that you mention RAILROAD MAN'S MAGAZINE.

JEWELRY AT WHOLESALE PRICES

1/2 SAVED DIRECT FROM MAKER SAVE 1/2

Keep in tune with the times, buy wholesale, save ONE-HALF. Any Diamond you choose, no middlemen to pay, you get Price, Quality and your money's worth. Send to-day for your Diamond, Watch or Jewelry and save ONE-HALF. We ship C. O. D. with Free Examination Privilege. Full money back guarantee within 10 days if not satisfactory. 160 Pg. Catalog

WE RETAIL AT WHOLESALE PRICES

SEND FOR CATALOG NO. 104

7 DIAMOND CLUSTER RING $19.75

LOOKS LIKE ONE DIAMOND

$25 SOLID 14 K GOLD WATCH

12 size, 17 Jew. Illinois movt. Solid gold Wal. demar chain, solid gold Knife, retail price $42.50

$28

S. RAIVES & CO. EST. 26 YRS.

366 FIFTH AVE., NEW YORK.

1/4 CT. $14.25

1/3 CT. $31.75

1/2 CT. $77.25

3/4 CT. $127.75

5 ROADS TO BIG MONEY

ELECTRICITY | PLUMBING | BRICK LAYING | DRAFTING | MOTION PICTURE OPERATING

Which Book Do You Want? Fabulous salaries paid to trained men. Learn how you can earn $85 to $300 a month—in short time—at low cost. *These books tell all*—Electricity—Plumbing—Bricklaying—Drafting—Moving Picture Operating. No books—no classes. Experts train you in $35,000 shops—doing actual jobs—with actual tools—furnished free. Day or night. Big jobs are open. Act quickly. Write for *free* Trade Manual. *Mention course that interests you.* Ask about *free employment bureau*—how students earn while they learn—today.

B. W. Cooke, Director.

Coyne National Trade Schools, Dept. 1187

39-51 East Illinois Street, Chicago, Ill.

COYNE

DRAWING

LEARN BY MAIL IN YOUR OWN HOME

Newspaper, Magazine and Commercial Illustrating, Cartooning, Water Color and Oil Painting. Learn Drawing or Painting for profit and pleasure. We can develop your talent. This school has taught thousands. Free Scholarship Award—special limited offer. Your name and address brings you full explanation and our handsome illustrated Art Annual by return mail. Don't delay. Write today.

FINE ARTS INSTITUTE, Studio 677, OMAHA, NEB.

Bush Car Free

—and agency for your territory. Ride in a Bush Car. Pay for it out of your commissions on sales. Driving agents wanted in every community. Agents getting dozens of orders. Big demand. Big profits for you. Write at once for my 48-page catalogue.

Address J. H. BUSH, President. Dept. 1020

BUSH MOTOR COMPANY, Bush Temple, Chicago, Ill.

Wireless for Railroad Men

Learning wireless is easy if you have reliable instruction book and equipment. Send today for FREE Wireless Book "C," written in plain, non-technical English. Fine for beginners. Contains list of inexpensive wireless apparatus, that you can buy on strict money-back guarantee.

C. BRANDES, Inc.,

Wireless Receiver Specialist,

Room 823, 32 Union Square, New York

EARN TELEGRAPHY

Morse and Wireless—R. R. Accounting (Station Agency) taught. Splendid opportunities. Positions secured. Marconi Co. contracts to employ graduates. We own and exclusively occupy two large modern buildings equipped with R.R. and Western Union wires and complete 2 K. W. Marconi Wireless Station. Largest school—established 42 years. Investment $25,000. **Endorsed by Railroad, Marconi and Western Union Officials. Expert practical teachers.** Low living expenses easily earned if desired. Tuition low. Easy payments. Correspondence courses also. Catalog Free.

Dodge's Telegraph, Ry. & Wireless Institute

Mallory Street, Valparaiso, Ind.

COPY THIS SKETCH

and let me see what you can do with it. Illustrators and cartoonists earn from $20 to $125 a week or more. My practical system of personal individual lessons by mail will develop your talent. Fifteen years successful work for newspapers and magazines qualifies me to teach you. Send me your sketch of President Wilson with 6c in stamps and I will send you a test lesson plate, also collection of drawings showing possibilities for YOU.

The Landon School of Illustrating and Cartooning

1429 SCHOFIELD BUILDING, CLEVELAND, O.

WIRELESS

The Most Fascinating Pastime Known

Hear Uncle Sam's weather reports and exact time twice daily. Instructive, Educational and wonderfully interesting. Price is exceedingly low and no cost of maintenance. Send for our complete Electrical Cyclopedia No. 16, today, containing 275 pages, 658 illus's, 2000 articles. Morse, Continental and Navy Codes, Treatise on Wireless Telegraphy, besides valuable tables, formulas, and coupons for 20-lesson Free Wireless Course, etc. **Cyclopedia sent free on receipt of 4c. to cover postage only.** *None sent otherwise.* Book also lists complete line of electric novelties, flash lights, toys, sporting goods, lighting plants, motors, experimental apparatus, etc., etc. "IT'S THE LIVEST CATALOG IN AMERICA."

The Electro Importing Co.,

[48 FULTON STREET, NEW YORK.

"Everything for the Experimenter"

LANGUAGES

Quietly Learned AT HOME by the Original Phonographic Method

German—French—English—Italian—Spanish

or any other language learned with comparative ease by the Cortina Method at home with Disk Cortinaphone Language Records. Write for FREE booklet today; easy payment plan. Inquire at your local phonograph dealer who carries or can get our records for you.

Cortina Academy of Languages

Suite 2110, 12 E. 46th St., N. Y.

CORTINAPHONE

EARN $2,000 TO $10,000 A YEAR

We will teach you to be a high grade salesman, in eight weeks at home and assure you definite proposition from a large number of reliable firms who offer our students opportunities to earn Big Pay while they are learning. No former experience required. Write today for particulars, list of hundreds of good openings and testimonials from hundreds of our students now earning $100 to $500 a month. Address nearest Office. Dept. 501

NATIONAL SALESMEN'S TRAINING ASSN.

Chicago New York San Francisco

"You Get The Job"

"We've been watching you, young man. We know you're made of the stuff that wins. The man that cares enough about his future to study an I. C. S. course in his spare time is the kind we want in this road's responsible positions. You're getting your promotion on what you *know*, and I wish we had more like you."

The boss can't take chances. When he has a responsible job to fill, he picks a man *trained to hold it.* He's watching you right now, hoping you'll be ready when your opportunity comes.

The thing for you to do is to start today and train yourself to do some one thing better than others. You can do it in spare time through the International Correspondence Schools. Men in all lines of railroad work are winning promotion through I. C. S. spare-time study. Over 5000 students reported advancement last year as a result of their I. C. S. training.

The first step these men took was to mark and mail this coupon. Make your start the same way—and make it right now.

I. C. S., Box 5923, Scranton, Pa.

25th Anniversary I. C. S.

In October, 1916, the International Correspondence Schools will celebrate the completion of 25 years of successful educational work in the interest of technical and industrial preparedness. More than 130,000 men and women are NOW STUDYING I. C. S. Courses, preparing for advancement and greater service to their employers and their country.

TEAR OUT HERE

INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 5923, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

☐ Locomotive Engineer	☐ R. R. Agency Accounting
☐ Locomotive Fireman	☐ R. R. Genl. Office Acc'ting
☐ Traveling Engineer	☐ Bookkeeper
☐ Traveling Fireman	☐ Stenographer and Typist
☐ Air Brake Inspector	☐ Higher Accounting
☐ Air Brake Repairman	☐ Mathematics
☐ Round House Foreman	☐ Good English
☐ Trainmen and Carmen	☐ Salesmanship
☐ Railway Conductor	☐ Advertising Man
☐ Mechanical Engineer	☐ Civil Service
☐ Mechanical Draftsman	☐ Railway Mail Clerk
☐ Machine Shop Practice	☐ Electrical Engineer
☐ Boiler Maker or Designer	☐ Electrician
☐ Steam Engineer	☐ Electric Wiring
☐ Steam-Electric Engineer	☐ Electric Lighting
☐ Civil Engineer	☐ Telegraph Expert
☐ Surveying and Mapping	☐ Mine Foreman or Engineer
☐ R. R. Constructing	☐ Metallurgist or Prospector
☐ Bridge Engineer	☐ Chemical Engineer
☐ Architect	☐ Agriculture ☐ Spanish
☐ Architectural Draftsman	☐ Poultry Raising ☐ German
☐ Contractor and Builder	☐ Automobiles ☐ French
☐ Structural Engineer	☐ Auto Repairing ☐ Italian

Name_____

Occupation & Employer_____

Street and No._____

City_____ State_____

If name of Course you want is not in this list, write it below.

A BIGGER JOB For YOU

Earn from $35 to $100 Weekly as a

TRAFFIC MANAGER

Modern transportation is a jungle of **routes** and **rates** calling for specialists who, like the **pathfinders** of old, have expert knowledge of the **trails of traffic.** How to route shipments to obtain **shortest mileage** and **quickest deliveries** and how to **classify** goods to obtain **lowest rates** are two vital factors in business competition. The man who **knows how** is so valuable to his employer that he commands respect and big remuneration.

Big Salaries Paid To Traffic Managers

Expert traffic managers command from $2,500 to $10,000 a year. Why not prepare yourself to fill one of these lucrative positions?

New and Uncrowded Profession

Every railroad and over one half million large shippers in the United States need expert traffic men, and this need is recognized as never before because of the recently enacted railroad rate laws and interstate commerce regulations. The demand for trained and efficient traffic men is many times greater than the supply. **There's room for you.**

Study Traffic and Interstate Commerce

Decide now to become a traffic man. Our Interstate Commerce Course enables you to study **at home,** without leaving your occupation or sacrificing present income, and to become thoroughly versed and proficient in the **strategy of shipping,** including routes and classifications, Interstate commerce rules and regulations, etc. The instruction is given by some of the biggest traffic managers in the country. The course is easy to grasp and thoroughly practical. Anyone with ordinary intelligence, with reasonable application, can master this new profession.

FREE PORTFOLIO Clip coupon below, sign and mail at once, and we will send you **FREE,** postpaid, a handsome, portfolio containing complete information concerning the opportunities and requirements of this attractive profession. **Get posted at once.** Clip coupon.

LaSALLE EXTENSION UNIVERSITY, Dept. 1065-C Chicago

"The World's Greatest Extension University"

FREE PORTFOLIO

— — COUPON — —

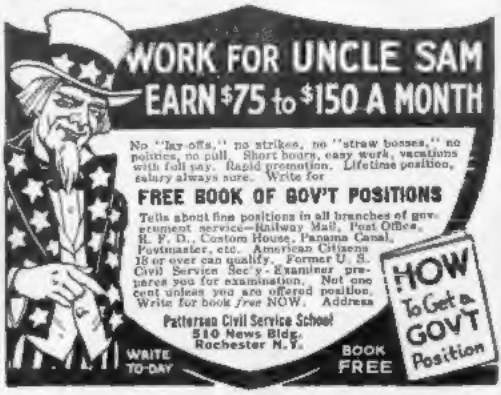
LaSalle Extension University,
Dept. 1065-C Chicago, Ill.

I am interested in the new profession—Traffic Management. Please send me full information and Traffic Book, free of all cost.

Name.....

Occupation.....

Write address on the margin plainly.


WORK FOR UNCLE SAM
EARN $75 to $150 A MONTH
No "lay-offs," no strikes, no "straw bosses," no politics, no pull. Short hours, easy work, vacations with full pay. Rapid promotion. Lifetime position, salary always sure. Write for
FREE BOOK OF GOV'T POSITIONS
Tells about fine positions in all branches of government service—Railway Mail, Post Office, R. F. D., Custom House, Panama Canal, Postmaster, etc. American Citizens 18 or over can qualify. Former U. S. Civil Service Sec'y-Examiner prepares you for examination. Not one cent unless you are offered position. Write for book *free* NOW. Address
Patterson Civil Service School
510 News Bldg.
Rochester N. Y.
WRITE TO-DAY
BOOK FREE
HOW To Get a GOVT Position

Typewrite The New Way

Earn $25 to $40 a Week

Don't be satisfied with $8 to $15 weekly! Don't be held back by the old way in typewriting! Learn the wonderful New Way, at home, in 10 simple, easy lessons. Earn $25, $30, $35 and even $40 a week! Already *thousands* of telegraphers, stenographers and other typewriter users who never exceeded 30 to 40 words a minute are writing 80 to 100 words a minute, *with half the effort* and with *infinitely* greater accuracy; and their salaries have been *doubled and trebled!*

80 to 100 Words a Minute Guaranteed

Most telegraphers and stenographers earn such *small* salaries simply because they *lack speed and accuracy on the typewriter.* No matter how good you are at sending or receiving or at shorthand, you can never expect much increase in pay until you get *speed—real speed*—and *accuracy* on the typewriter. You can typewrite 80 to 100 words a minute the New Way!

Learn at Home—10 Easy Lessons

Think of it! Only 10 easy lessons. Not the slightest interference with your present work. You learn at home quickly and easily, improving in speed with the VERY FIRST LESSON! Special GYMNASTIC Finger training Exercises bring results in DAYS that ordinary methods will not produce in MONTHS. Among the thousands of operators who have taken up this system are many who were so-called "touch" writers—yet there has not been a single one who hasn't DOUBLED or TREBLED his or her speed and accuracy!

NEW BOOK FREE

We cannot describe here the secret principle of this new method. But we have prepared a 48-page book which tells all about it in complete detail. No instruction book ever written, no matter what it costs, ever told so plainly the real WHY and HOW of expert typewriting. The book is **FREE.**

Mail Coupon or Postal NOW

Mail the coupon or postal today—NOW.

THE TULLOSS SCHOOL
5310 College Hill
Springfield, Ohio

USE THIS FOR BIGGER PAY

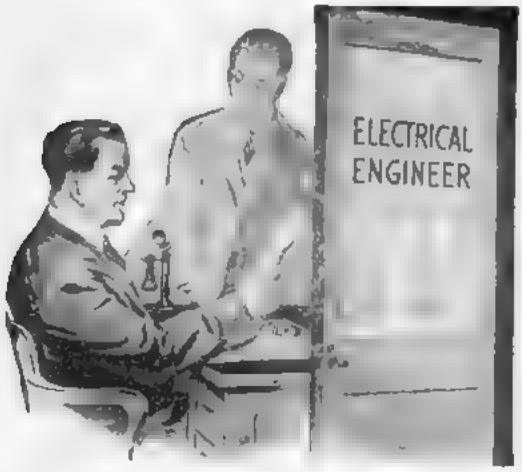
THE TULLOSS SCHOOL OF TYPEWRITING,
5310 College Hill, Springfield, Ohio.

Please send me your Free Book about the New Way in Typewriting. This incurs no obligation whatever on my part.

Name.....

Address.....

City..... State.....



The Electrical Engineer Is the Man of the Hour and the Future!

EVERYWHERE electricity is now being used for power, light and heat. All other agents are out of date. Nevertheless Thomas A Edison says that we have only begun to realize the tremendous possibilities in the field of electricity. Golden opportunities await the Electrical Engineer. His work is fascinating—and big salaries are paid. The Electrical Engineer is the man of the hour and the world pays him accordingly.

$2,500 to $5,000 a Year

That's an ordinary salary for an Electrical Engineer. All over the civilized world men with a thorough knowledge of electricity are in demand and naming their own salaries. And the training given in preparation for one of these positions can be obtained right in your own home.

Practical Training— Right in Your Own Home

By our new thorough complete course of instruction you can get practical training in Electrical Engineering right in your own home. Electrical Engineering has been simplified. You do the experiments yourself just as if you were actually engaged in the work. You learn theories, too, and graduate a full-fledged Electrical Engineer

Send the Coupon For Our New Book

Put your name and address on the coupon or on a letter or postcard and get our new book on Electrical Engineering. It will tell you about the splendid opportunities that are awaiting you. The book is free and it carries a vital message to every ambitious man. Put your name and address on the coupon now. Opportunity is calling and saying, "Send the coupon."

American School of Correspondence
Dept. E1097
Chicago, U.S.A.

American School of Correspondence
Dept. E 1097 Chicago

Please send me your free book on Electrical Engineering.

Name .....

Address .....

"I WANT YOU"

-Uncle Sam

PAY $75 TO $150 MONTH

U. S. Government Wants Railway Mail Clerks—
City Mail Carriers—Postoffice Customs—
Internal Revenue Clerks
Common education sufficient

SEND COUPON BELOW

FRANKLIN INSTITUTE
Dept. O-102 ROCHESTER, N. Y.

Send coupon immediately. We are coaching candidates free. This coupon does not bind you in any way. Write plainly and tell us your age. We will send you a free copy of our book explaining all about Positions and How to Get Them" free List of positions now easily obtainable and terms of our Special Offer to candidates for Free Coaching for the examination here checked.

COUPON

Railway Mail Clerk	$900 to $1800	Customs Positions	$800 to $1500
Postoffice Clerk	$800 to $1200	Internal Revenue	$700 to $1800
Postoffice Carrier	$800 to $1200	Stenographer	$800 to $1500
Rural Mail Carrier	$500 to $1200	Clerk in the Departments at Washington	$800 to $1500
Bookkeeper	$900 to $1800		

Canadian Government Positions ---

Name .....

Address O-102

Use this before you lose it *Write plainly*

SHOOT Ithaca Guns

MADE IN U.S.A.

REASON 6
COIL MAIN SPRINGS
WARRANTED

¶ Did you ever stop to think why they use coil springs under heavy freight cars?
¶ Did you know that Uncle Sam uses coil springs in Army guns?
¶ Did you know that all late model Ithaca guns were equipped with coil main springs?
¶ Flat springs are not as fast nor as durable as coil springs.
¶ We warrant our coil main springs never to break
¶ Large catalog FREE—Double guns, $17.75 up single trap guns, $85.00 up

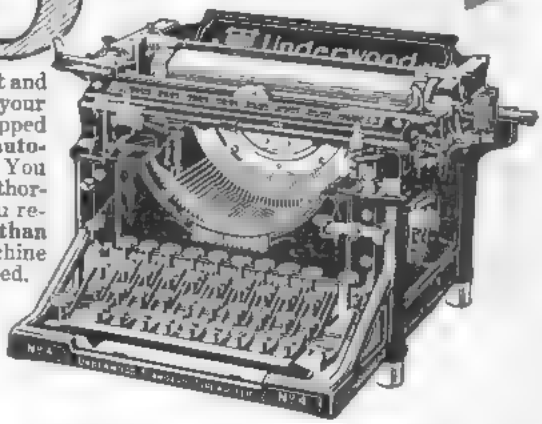
ITHACA GUN COMPANY
ITHACA, N. Y.

10 DAYS FREE TRIAL

Late Model
UNDERWOOD TYPEWRITER

$43.85

2 Color Ribbon
Back Spacer
Tabulator, etc.



Without one cent advance payment and without the slightest obligation on your part, express charges prepaid. Equipped with the late improvements—**two color automatic ribbon, back spacer, tabulator,** etc. You **do not pay for the machine until you have thoroughly inspected and tried it out,** then you remit our special cash price of $43.85 **(less than one half manufacturer's price** and the machine **is yours. Easy payment plan arranged if desired.**

Every machine guaranteed for 5 years.

The quantity is limited—so write today

METRO TYPEWRITER COMPANY
65 Front Street Brooklyn, N. Y.

WHAT DO YOU KNOW

about the high cost of living in Ancient Rome?

JOSEPH IVERS LAWRENCE

tells an interesting tale about it in the

OCTOBER ARGOSY

The story is called

"Peacocks for Caesar"

However, the feature of the issue is a novel length story by

SEWARD W. HOPKINS

Entitled

"The Man Hunt on Capitol Hill"

A twenty-four chapter story of mystery and surprise

ON ALL NEWS-STANDS—TEN CENTS

THE FRANK A. MUNSEY COMPANY, 8 West Fortieth St., New York

LUDEN'S Stop Throat Tickling

Throat irritations won't disturb your sleep if you use Luden's. Clear the head—soothe the throat.

In "Yellow Box—5c

LUDEN'S

MENTHOL CANDY **COUGH DROPS**

Luden's is not a "cure-all" but gives quick relief and eases the throat of thousands of regular users

WM. H. LUDEN, Mfg. Confectioner, READING, PA.

The Opportunity of A Railroad Career

Do you know that many of the master minds of the Country began as Telegraph Operators and Station Agents? The chances are greater to-day than ever. Let us show you how you can quickly secure a lucrative position and put your foot on the first rung of the Ladder of Success

Our Offer to You

Practical, experienced Railroad men will teach you in an easy, fascinating way all you need to know. Our course—the most complete in the United States—includes miniature railroad trains, switches, towers, block signal systems, telegraph, telephone, tank to tank wireless telegraph set in work at a radius of 1500 miles. We train you thoroughly and give you a foundation of railroad knowledge that makes great railroads come to us for men

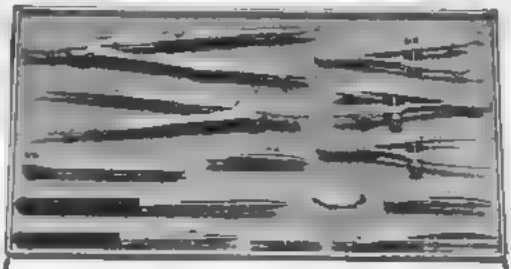
Positions Open Now

The demand for efficient railroad men exceeds the supply. Don't neglect this opportunity—send no money—simply write us for illustrated catalog and full information *to-day*

Railway Commercial Training School

(In Co-operation with the Erie R. R.)

111-115 MAIN STREET, ELMIRA, NEW YORK



Imported Drawing Instruments Free!!

YES, I will give you this exquisite set of imported drawing instruments absolutely free and I will give you a 20 x 25 inch drawing board, a 24 inch T square, 1 12-inch rule, a supply of drawing paper, 2 triangles and a French curve, pencils, erasers, thumb tacks, etc. The instruments go in a superb plush lined leather case—they are genuine working instruments and I don't think you could duplicate this outfit for less than $15. But I give it away *absolutely free* to the men who get my personal instruction

Be a Draftsman!

Draw $125 to $175 Per Month

There is an urgent demand for skilled draftsmen. Companies are issuing calls every day for men to fill positions paying from $2500 to $3500 per month. I will give you just the training you need to hold one of these big jobs—right in your own home. Write now.

Chief Draftsman

Will Instruct You Personally

I am Chief Draftsman of a large and well known firm. I have been doing the highest paying expert drafting work for a quarter of a century and I know just the kind of training that is rewarded from men who get the big salaries. During my spare time I will train a few ambitious men to hold big jobs, while they remain in their own homes. You will get special work to do—practical instruction and suggestions by your self-supervised correspondence regardless of how long it takes. Write today—now—act at once.

Pay As You Wish

I want ambitious men. Don't worry about the small charge I make for my instruction. Write today.

Chief Draftsman Dobe

Send the Coupon for Big New Book

Send the coupon or a letter or a postcard and get my new book free, also full particulars of your liberal Pay As You Wish Offer. Act now.

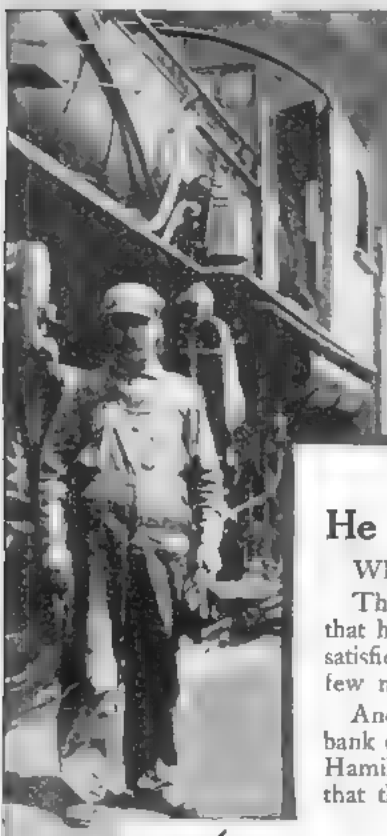
Engineer's Equipment Co.
Div. 1097 Chicago, Ill.

Without any obligations on me whatsoever, please mail your book "Successful Draftsmanship" and full particulars of your liberal "Pay As You Wish" special instruction offer to a few students. It is understood that I am obligated in no way whatever

Chief Draftsman Dobe
Engineer's Equipment Co., Inc.
Div. 1097
Chicago, Ill.

Name .....

Address .....



Engineer Chris. McGinnis of the Santa Fe California Limited. He has carried a Hamilton for years with perfect satisfaction.

He is Glad He Bought a Hamilton

When you buy a Hamilton Watch you buy satisfaction.

The railroad man who bought a Hamilton so long ago that he isn't sure whether it was twelve or fifteen years is satisfied. The man who bought a Hamilton recently—a few months or a year or two ago—is satisfied.

And if you decide today to buy a Hamilton, you can bank on the same satisfaction. It is a knowledge that the Hamilton has the accuracy, durability and dependability that the railroad men must have.

Hamilton Watch

"The Railroad Timekeeper of America"

The Hamilton Watch is made in all standard sizes and sold by jewelers everywhere. For Time Inspection Service, Hamilton No. 940 (18 size—21 jewels) and No. 992 (16 size—17 jewels) are the most popular watches on American Railroads and will pass any official Time Inspection. For general use you can buy a Hamilton Watch from $12.25 for movement alone (in Canada $13.00), up to the superb Hamilton Masterpiece at $ 50.00 in 18k heavy gold case. No extra charge for Safety Number. Illustrations and prices of Hamiltons. A Hamilton movement can be fitted to your present watch case if you desire.

Write for the Hamilton Watch Book—
"The Timekeeper"

It pictures and describes the various Hamilton models and gives interesting watch information.

HAMILTON WATCH COMPANY

Dept. 53 **Lancaster, Pennsylvania**

THE RAILROAD MAN'S MAGAZINE

Vol. XXXI. OCTOBER, 1916. No. 2.

BIG RAILROADING—4.

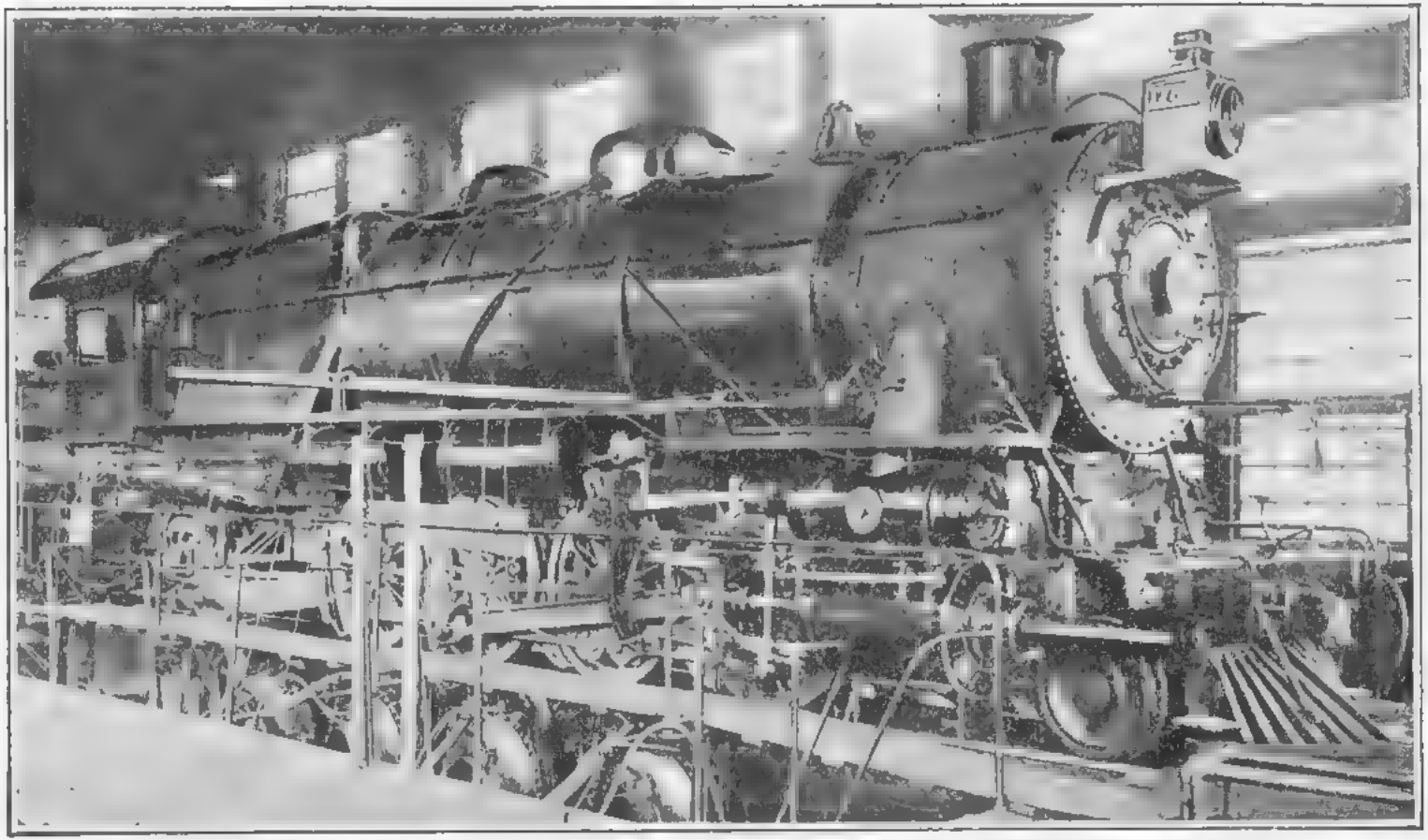
HOW SCIENCE BOOSTS THE RAILROAD'S REVENUES BY SEEING THAT THE COMPANY GETS WHAT IT HAS PAID FOR.

A SCHOOL FOR HAULING IS CONDUCTED BY A LOCOMOTIVE THAT HASN'T MOVED THE HUNDREDTH PART OF AN INCH IN TWELVE YEARS—TENSION AND COMPRESSION MACHINE WITH A CAPACITY OF 1,000,000 POUNDS—SOME SIDE-LIGHTS ON HOW TO MAKE BRICKS WITHOUT STRAW, AS DEMONSTRATED BY THE ATHLETIC CAR-REPAIRMAN.

BY CHARLES FREDERICK CARTER,
Author of "When Railroads Were New."

SOMEWHERE among the shops at Altoona, almost any business day, the stertorous snorting of a locomotive may be heard, indicative of a speed that should not be tolerated within yard-limits. This railroad joy-rider never seems to tip over the hill, never seems to be hooked up a notch, but just keeps on chewing cinders hour after hour, yet never getting anywhere, apparently; for all the fuss comes uninterruptedly from one place.

Upon investigation this place will be found to be a one-story building hidden away behind No. 3 Roundhouse. Open



PULLING A FULL TONNAGE OF IDEAS. THIS LOCOMOTIVE HAS BEEN POUNDING AWAY FOR YEARS WITHOUT GETTING AN INCH AHEAD—IT IS OPERATED AS A TEST-MACHINE TO DETERMINE BOILER EFFICIENCY, THE PROPER DIMENSIONS OF PISTON-VALVES, AND KINDRED SUBJECTS

the door, and the locomotive that has been creating all the disturbance will stand revealed. At the same time, the reason why such slow progress is made is also disclosed; for this locomotive is hauling a "consist," which is composed exclusively of ideas.

The fact that it, or others like it, has been tugging away in the same spot for twelve years, never moving ahead more than the hundredth part of an inch, may be accepted as evidence that here, as elsewhere, ideas come hard. Still, they do come; for when the Pennsylvania Railroad's famous locomotive-testing plant once gets a half-Nelson on a theory it hangs on, like a dog to a root, until that theory is dragged forth into the noonday glare of exact knowledge.

Considering that this locomotive-testing plant is operated almost continuously by a foreman, an assistant, and twenty-six men, it would be strange indeed if the grist it ground out did not include some discoveries of value.

To tell the truth, the discoveries made here have been both numerous and important. Their practical application may be seen exemplified in any recent Pennsylvania locomotive; or, for that matter, any other locomotive of recent construction that may be handy.

It would have been no more than just and natural for the company to have reserved for itself the fruits of its own enterprise; but it has chosen, instead, to be more than liberal in giving to the public the information it has collected in scientific papers, addresses, and bulletins, and this information has been as freely utilized by others.

Some Examples of Engine Eugenics.

To descend from the general to the particular, two or three examples may indicate the character of the services rendered by this unfortunate locomotive, doomed, like a squirrel in a revolving cage, always to travel without getting anywhere. For instance, there are the new Atlantic type locomotives designed for heavy and fast passenger traffic where grades are not too stiff.

These engines were educated at the testing-plant. Their predecessors, which had boiler tubes 13 feet 9 inches long, were found to be suffering from excessive smoke-box temperature and low efficiency —malnutrition, anemia, and fever, so to speak. The treatment indicated, as the doctor would say, was to lengthen the tubes to 15 feet. When this was done boiler efficiency was found to have increased 15 per cent, which allowed the diameter of the cylinders to be enlarged an inch and a half, thereby increasing the power of the locomotive.

Standardized Piston-Valves.

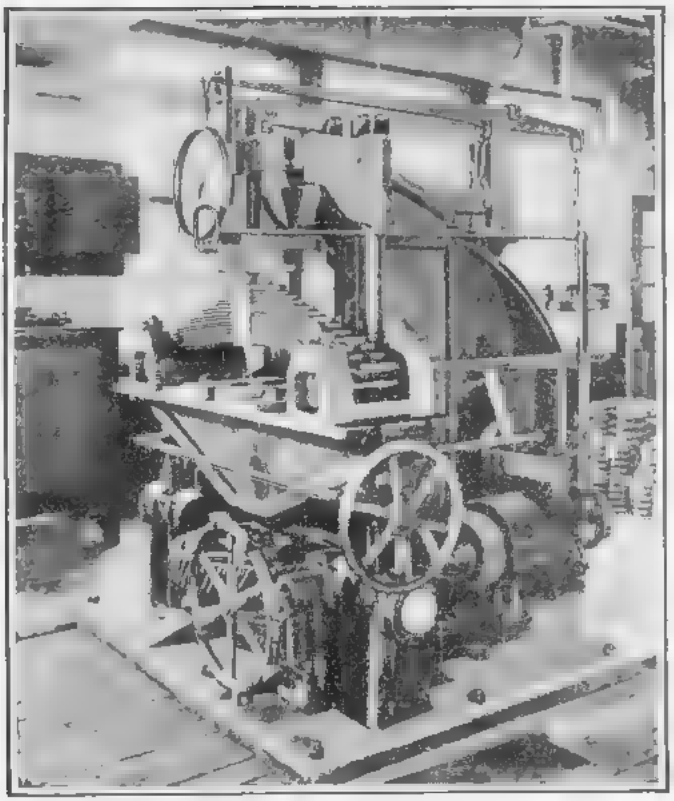
Again, it had been customary to use different-sized piston-valves in different-sized locomotives, a perfectly natural thing to do. Some of these piston-valves were as much as 16 inches in diameter and weighed as much as 263 pounds.

The whole object of the locomotive designer being to get rid of weight where he doesn't want it in order to have a chance to increase it where he does want it, a series of experiments with piston-valves was undertaken at the testing-plant. The result is that now a piston-valve 12 inches in diameter and weighing 120 pounds has been made the standard for locomotives having cylinders anywhere from 20 to 27 inches in diameter.

Other experiments conducted at the testing-plant have resulted in extreme care being bestowed upon the counterbalancing of driving-wheels with corresponding benefit to road-bed and motive power.

The wire-test originated at Purdue University—it consists in introducing a wire beneath the driving-wheel when running—measures the effect of the wheel by the variations of thickness of the wire at different points in the revolution of the wheel.

These wire-tests have demonstrated that a badly balanced driving-wheel actually leaves the rail at a certain point



CHEWS LOCOMOTIVE SPRINGS LIKE GUM—THE JAWS WHICH ARE THE MOST PROMINENT PHYSICAL CHARACTERISTIC OF THIS MACHINE ARE CAPABLE OF EXERTING 75,000 POUNDS PRESSURE

in its revolution at certain speeds. Of course this results in a tremendous hammer-blow on the rail, destructive both of the rail and of the locomotive.

Now every Pennsylvania locomotive driving-wheel before being placed under an engine is tested in a balancing press and lead is added to or taken from the counterbalance until it is exactly right.

The locomotive to be tested is mounted on a series of supporting wheels which, with other parts of the testing-apparatus, are set in a pit. There are two sets of these supporting-wheels, one of three pairs 72 inches in diameter for passenger-locomotives with large drivers, the other of five pairs 50 inches in diameter for freight-locomotives.

These supporting-wheels revolve with the driving-wheels resting upon them, but, of course, in the opposite direction, precisely like any friction gearing. The locomotive may be retarded to any extent desired by absorption - brakes upon extensions of the axles of the supporting wheels. These absorption-brakes consist, first, of a revolvable iron disk with radial grooves, keyed to the shaft of the supporting wheels; second, of a housing for the disk having its bearing upon the hub of the disk; third, of a pair of thin copper plates fastened to the housing parallel with and close to the sides of the disk, one plate having back of it a chamber in the housing; fourth, a system of piping and connections by which water under pressure can be circulated through the chambers between the copper plate and the housing; fifth, of a system of pipes and connections by which oil is circulated to insure perfect lubrication of the copper plates next to the revolving disk.

Scientific Harness for the Locomotive.

When the locomotive is running water under pressure flows through the chambers in the housings, pressing the copper plates against the sides of the revolving disks and causing resistance to rotation. The water serves the double purpose of supplying the friction required and of carrying off the heat generated.

An automatic valve governed by the locomotive regulates the water supply. If the speed becomes too high a by-pass opens and increases the pressure on the brakes; if it falls too low a valve closes and reduces the pressure. During tests a man is detailed to sit within reach of

valves controlling the inlet and outlet independently, to guard against any failures.

The work actually done by the locomotive consists in overcoming the frictional resistance of the supporting wheels and brakes, the resulting tractive force exerted at the draw-bar being recorded by a traction dynamometer.

When working at full capacity the locomotive does not move forward more than the hundredth part of an inch. Whatever forward motion does take place is multiplied two hundredfold by the tracing pen of the dynamometer on a ruled sheet of paper traveling over a drum. This sheet of paper constitutes the record of the locomotive's pulling capacity for each minute of the test.

A great variety of other records are made with engine indicators, draft-gages, thermometers, and pyrometers, calorimeters to ascertain the quality of the steam, revolution counters and tachometers to obtain the number of revolutions per minute. Coal and feed-water are weighed, and the amount of each consumed per hour is recorded.

In addition to this, any special piece of apparatus that may happen to be undergoing a test must be watched and its performance gaged by instruments. Throughout the test the whole staff is as busy as the proverbial nailer accumulating an immense mass of data which, when analyzed by some one who knows how, lays bare the whole character and capacity of the locomotive under the conditions given and of any experimental parts introduced into its anatomy.

Tests That Save a Million a Year.

A railroad company that has deemed it worth while to conduct a series of locomotive tests on so elaborate a scale extending through so many years might naturally be expected to go much farther in endeavoring to put railroading on a scientific basis. Still, one is hardly prepared to be shown a handsome four-story building, with a floor area of 41,000 square feet, with the information that it is the headquarters of the engineer of tests and his force of 320 men; that the expenses of the department are $534,000 a year; that it inspects and tests material entering into the construction of the company's rolling-stock and track valued at upward of $82,000,000 a year; and that it saves the company a direct loss of nearly a million dollars annually by preventing the purchase of material not up to specifications.

Could Not Trust Seller's Say-So.

In common with the rest of mankind, the Pennsylvania Railroad learned by melancholy experience early in life that neither the reputation of a manufacturer nor a superficial examination of the goods he offered was always a sure safeguard in the purchase of supplies, since the manufacturer himself, however honest his intentions, had no positive knowledge of the physical properties of the materials he used nor of the purity of his product. The worst of it was that he did not know how to find out anything about either. The buyer had to look out for himself or take the consequences.

At a very early stage in its career, therefore, the Pennsylvania Railroad Company resolved to look out for itself to the extent of its ability in purchasing materials. A testing-machine was set up in the Altoona shops, where the first physical test of steel was made on April 2, 1874.

For a few months the testing work was conducted by the master mechanic of the Altoona shops; but in August, 1874, John W. Cloud was employed as the first engineer of tests on any railroad and placed in charge of the department of physical tests. A year later a chemical laboratory was added under the direction of Dr. C. B. Dudley, who held the position until his death in 1909.

The first researches undertaken were with a view to the improvement of rails, which then, as now, needed all the improvement they could get. In due time

the first standard specifications were prepared, and the series has been growing ever since.

Five years after the testing of materials was begun the scope of work had increased to such an extent that the young department was provided with a separate

of production and make sure that they are carried out as required, and to obtain samples to be subjected to physical, chemical, and microscopic analysis in a general laboratory-car fitted up for making metallographic examinations at the steel mills.

NO, NOT LUMBER; IT'S STEEL. THEY USE IT FOR THOSE CUTE LITTLE CARS THAT SCOOT HITHER AND YON HAULING OUT THE FREIGHT AND HAULING IN THE DIVIDENDS

building. Since then the work has increased more than a hundred per cent a year. In fact, the test department has grown more rapidly than any other department of the railroad. There seems to be no limit to the demands made upon it.

Specifications are prepared for practically everything bought or used by the railroad, and a never ending round of inspections and tests is maintained to see that every article measures up to the specifications. When the more important articles—such as rails, for example—are being manufactured, the inspectors are sent to the works to watch the processes

Mention of the laboratory-car calls to mind the fact that an important part of the test department's work is done in the field. Realizing that promises made under duress are not binding in law, the company does not rely upon records, however promising, made by a locomotive placed in an unnatural position over the test-pit and in the presence of strangers, but sends road assistants from the test department out on the first trips of locomotives embodying new features, and yet other road assistants in a dynamometer-car tagging along behind it to check up its tonnage rating.

All sorts of experimental appliances

on motive power, rolling-stock, and right-of-way are methodically followed up by the test department's road assistants. Material inspection alone keeps a chief inspector, assistant chief inspector, and eighty-one men busy. In the course of a year upward of 61,000 separate material reports are made.

Machine Chews Springs Like Gum.

While much of the test department's work must necessarily be performed in the field, the greater part is done at the Altoona laboratories. In the basement is a machine-shop where specimens are prepared for testing.

In one corner is a heavy machine with a locomotive spring between its jaws upon which it is chewing with the tireless energy of the gum brigade in a New York elevated train, hour after hour, day after day, alternately compressing the spring under 75,000 pounds pressure and relaxing it in an endurance test to see how long it may be expected to stand up under the sort of treatment to be met with in service.

The street floor is entirely devoted to physical tests. At one end is a line of five universal tension and compression testing-machines, the largest of which has a capacity of 1,000,000 pounds. Here all day long young men in shirt-sleeves pull pieces of steel apart in the machines and record the number of the specimen, the number of pounds tension at which it broke, the elongation and reduction in diameter. This data goes up to the office, there to be joined with reports on microscopic and chemical analyses of specimens from the same lot. The acceptance or rejection of the lot depends upon the net conclusion from all the data.

A Course of Sprouts for Everything.

To give an idea of the immense amount of work done in the physical laboratory it may be said that in a year 149,863,693 pounds of bar iron were tested by sample and 6,246,611 pounds were rejected. Of staybolt iron, 15,385 tests representing 8,301,960 pounds were made; of cement, 29,231 tests were made representing 587,900 barrels, of which 13,600 were rejected; of axles, 164,810 were tested and 8,035 rejected.

Everything purchased or made in the company's own shops must undergo a variety of tests designed to prove its qualities. Take the item of air-brake hose, for illustration. As the company uses about 635,000 pieces a year, it is a matter of some importance to obtain the best possible.

Air-brake hose in service being exposed to the weather, one of the tests consists in hanging samples up on a rack on the roof for months at a time to see how it is affected by exposure. One piece in 200 is immersed in a tank of water while air at 140 pounds pressure is turned into the hose. If the fabric of the hose is porous bubbles rising in the water will betray that fact.

Air-Brake Hose Often Flunks.

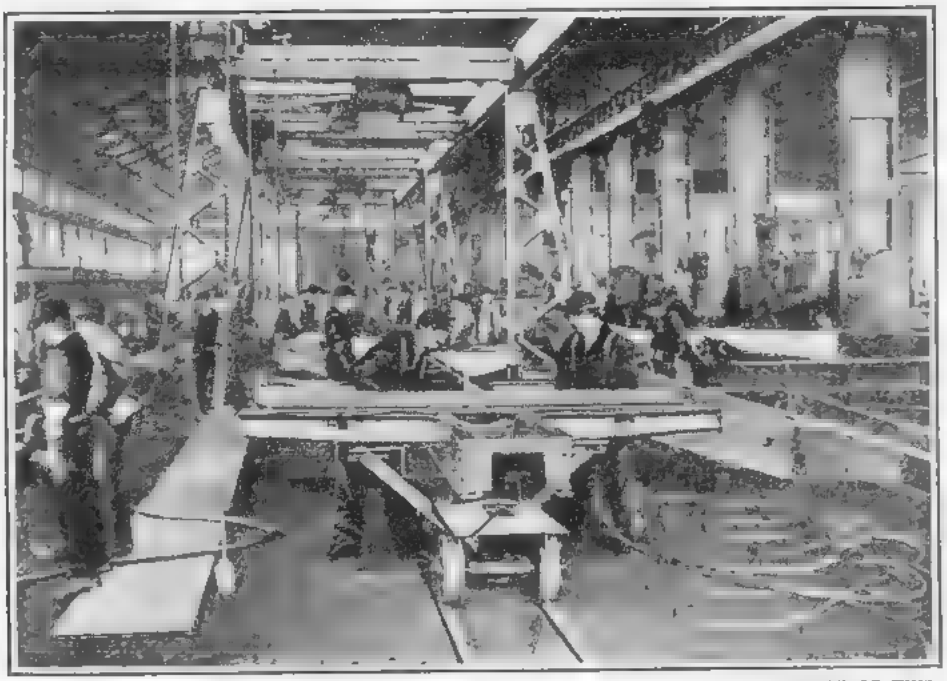
Next, the hose is subjected to pressure considerably above that at which it is to work to determine the liability to burst. Still other samples are put through an endurance test in a wiggling machine which gives a characteristic imitation of the jiggling, jerking motion of a train running at high speed over a rough track.

A large percentage of the hose tested fails to run this gantlet. Of 634,807 pieces sampled in a given year, 84,826 pieces, or more than one-eighth of the lot, were rejected.

Paints, too, are subjected to exposure tests on the roof and to a chemical analysis besides. Signal-oil, which is purchased by the car-load, is tested by burning in signal-lamps under service conditions. If the test-quantity does not burn the prescribed length of time the lot is rejected.

Other samples are subjected to an aging test to see whether it will break down within a given time-limit.

Safety fuses that flagmen light and jab into a tie when they are called in, which



AT WORK ON A PART OF THE FRAMEWORK OF A STEEL BOX CAR — ROLLING-STOCK OF THIS TYPE IS TURNED OUT AT ALTOONA AT THE RATE OF A CAR EVERY 55 MINUTES.

are supposed to burn ten minutes as a warning to whom it may concern to look out for tail-lights ahead, are lighted and thrust under water to see whether they are likely to go out in a violent rain-storm. They are dropped from various heights, jabbed into wood with varying force, timed to see if they burn the prescribed ten minutes, and subjected to various other practical tests.

Coal is examined to see whether it contains the number of British thermal units the company is paying for.

The chemical laboratory also analyzes and develops specifications for boiler compounds, lacquers, plush, car-cleaners, cutting compounds, belt-dressing, polishing compounds, hydraulic-jack liquids, track-caps, fire-extinguishing preparations, and many other things not connected in the lay mind with railroading.

Altogether eighty-five items ranging from asphaltum to zinc are brought under specifications which must be passed upon by the chemical laboratory.

Then, from time to time, the chemical laboratory is called upon to sit in judgment upon certain foods served in dining-cars. Again, it is consulted about conditions that may have led to the damage of freight in transit and asked to find some way to prevent such losses.

On one occasion the chemical laboratory made an exhaustive examination of tunnel air with a view to throwing light upon ventilating systems.

Regulations promulgated by the surgeon-general of the army in 1913, requiring railroad companies to furnish wholesome drinking-water and proper ice supply to passengers, and the necessity of furnishing good water for boiler use—a necessity that has existed as long as the locomotive—has led to the establishment of a bacteriological laboratory which in addition to water analysis also regulates the standardization of disinfectants and issues instructions for their use in the protection of passengers and employees, and superintends the disinfection of stock-cars.

Part of the work of the test department

for a year was the inspection while building at manufacturers' works of 343 steel passenger-cars and 24,966 freight-cars.

Thousands Build and Repair Cars.

While on the subject of cars, opportunity may be taken to say that an important part of the great shop system at Altoona is devoted to the construction and repair of cars. Passenger-car repairs and cohstruction keeps 1,400 men busy the year round. All-steel coaches are built at the rate of one a day. Approximately 250 passenger-coaches are given heavy repairs and 2,300 are given light repairs in the course of a year.

On the building of new freight-cars more than a thousand men are employed. The chief work of this character recently has been the building of all-steel box cars, which are turned out at the rate of one for each 55 minutes. The shops are also at work on an order of 100 all-steel cabin cars, or "cabooses," as they would be called on railroads farther toward the setting sun.

A few of the latter are already in service. Their fortunate occupants put on all sorts of airs over their fellows who must still get along with the little four-wheeled dog-houses, thereby stirring up bitterness and envy and all uncharitableness, although no bloodshed has yet been reported.

These two-story, all steel Pullmans are certainly nifty. In the first place, they are mounted on four-wheeled trucks, thus insuring easy riding. Next, they provide abundant room for the crew, for they are 31 feet long from face to face of draw-heads, 14 feet 9½ inches high over the cupola lamp, and 10 feet 2½ inches wide over the hand-holds with 30-inch platforms. The second story, or cupola, rises 2 feet 6 inches above the body of the car.

Inside are to be found all the comforts of home. There are six berths 6 feet 10 inches long and 2 feet 6 inches wide, a

IT'S A CINCH TO PUT THE SIDES ON A BOX-CAR, WHEN THEY COME TO YOU READY-MADE AND YOU HAVE A HUSKY TRAVELING CRANE TO DO THE HEAVY LIFTING.

stove for heating and cooking, a drop-table for dining or a sociable game, a water-cooler—just imagine a caboose with a water-cooler!—and—can you believe it?—

A washstand!

Positively, a washstand! And above it a reservoir that will hold ten gallons of water, as if the washstand was for service and not a parlor ornament.

Wherever there is room are lockers, drawers, and cupboards for equipment, for the official use of the conductor, for clothing and household supplies. The crowning feature is a jumbo of a refrigerator large enough to hold a barrel of sauerkraut, for instance.

The building of all-steel box cars, 6,500 of which are, or soon will be, in service, completes the line of steel equipment. Now everything in a train, from pilot-slats to tail-lights, from cab to cabin, including tank-cars, flat cars, gondolas, hopper-cars, and box cars, is built of steel. For the last nine years steel has been the standard for passenger-cars on the Pennsylvania, which has more steel passenger-cars than any other railroad in the world.

Steel Box Cars Cost $1,300 Each.

The first steel box car cost $1,500; but of course the cost has been reduced as building on a large scale developed, so that now the cost hovers around $1,300, which is still considerably more than the cost of the ordinary wooden box car.

These cars weigh 25 tons and have a carrying capacity of 50 tons. Each consists of a total of 129 pressed-steel parts held together by 5,100 rivets. In the course of construction they go through 27 classified operations in eight different positions on the erecting-tracks, the system followed being similar in a general way to that of the Pressed Steel Car Company's works at McKee's Rocks, which was described in the RAILROAD MAN'S MAGAZINE for July, 1916.

The fact is worth mentioning in this connection that the advent of the all-steel freight-car and its first cousin, the steel-underframe car, has materially reduced the number of freight-cars in service to the benefit of their owners. Whereas in 1900, 27,287 freight-cars were required to earn for a certain Eastern railroad revenues amounting to $15,135,100, in 1914 the same company earned a revenue of $28,448,000 with 28,241 cars.

That is, an increase of a scant 3½ per cent in equipment earned an increase of 87 per cent in revenues. The average number of tons per freight-train in 1900 was 325; in 1914 the average had increased to 625 tons. Furthermore, the larger freight-car of to-day is handled more efficiently and makes a greater number of trips in a year than the smaller car of fifteen years ago.

Car-Shops Office Flaunts Sports Trophies.

One prone to hasty conclusions might well suppose, upon entering an office-building in a lonely part of the vast shop-yards at Altoona, that he had blundered into a silversmith's show-rooms. Upon investigation, however, he would learn that he was in the entrance to the car-shop offices, and that the stunning display of silverware was merely composed of a few of the trophies amassed by the hired men on many a hard-fought athletic field.

All the shop-offices are more or less addicted to this habit of flaunting silverware in public, the large and varied assortment at the car-shops office indicating that the car-builders can play more different kinds of games better than those who cannot play as well as they do.

The vogue of athletics among the shopmen is something extraordinary. The officers have their clubhouse, golf-links, and tennis-courts on the hillside overlooking the car-works, while all the spare ground in the valley that is level enough is devoted to the great American game. An old church near the car-works has been converted into an athletic club for

the men, which is crowded to capacity nightly.

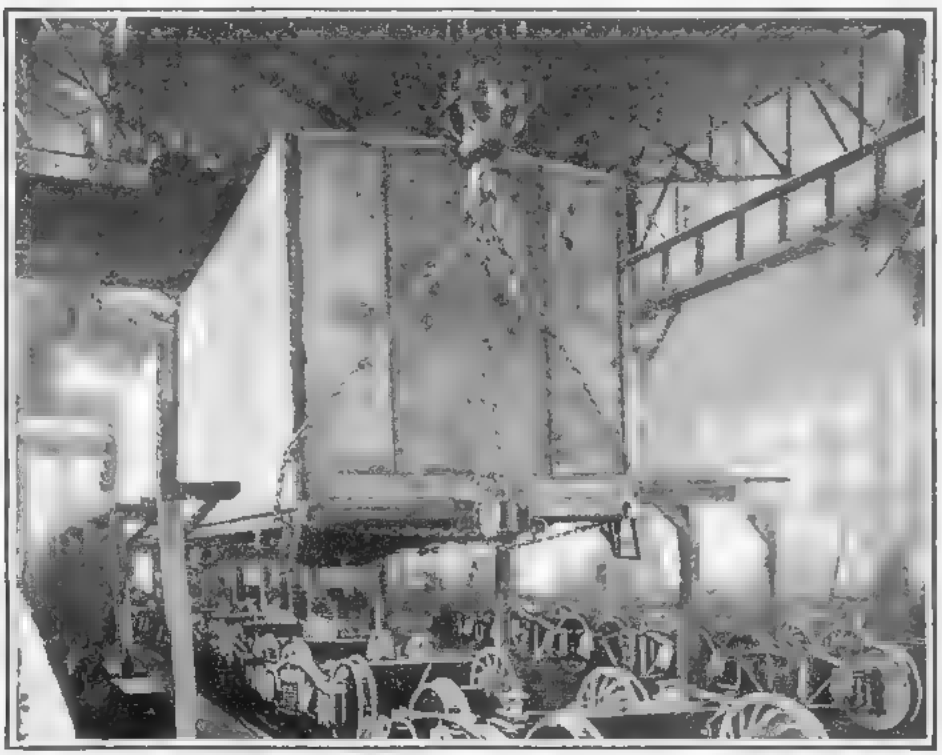
Repair More Than 130,000 Cars a Year.

Next to a locomotive a car will stand more tinkering than anything made by hands. As already noted, more than 1,400 men are employed on freight-car repairs at Altoona; they fix upward of 130,000 cars a year on the shop-tracks, the jobs ranging from the lightest to general reconstruction.

From five to seven cars are completely rebuilt every day, and about nine carloads of car-repair material are manufactured and shipped to other points of the line, for every division terminal must have its car-repair yards, not to mention other repair points between terminals.

The rebuilding is mostly done in the shops. One of these shops is a 39-stall roundhouse, forming a complete circle, each stall having room to accommodate two cars. This shop is set aside for wooden-car repairs.

In another shop near by steel cars are overhauled. Here battered coal-car bodies are lifted off their trucks and flipped upside down, or turned on their sides by a crane to facilitate cutting out damaged parts.



MR. WHEELS, MEET MR. CAR-BODY; MR. CAR-BODY, MEET MR. WHEELS. MAY YOU BE COMRADES INSEPARABLE!

Where Mr. Goodman Holds Forth.

Driving a rivet with any one of the various pneumatic tools provided for that purpose is a simple matter; but to get that rivet out again requires an operation, performed by two men with a sledge and a chisel, that looks so much like work that only persons with the strongest nerves can contemplate it with equanimity. Still, it is done; and in due course a disreputable old rounder of a car that the junkman would be ashamed to be

seen with rolls out of the shop as fresh and jaunty as an Easter bonnet.

For more characteristic examples of car-repairing it will be necessary to go to "Goodman's yard." Everybody knows Goodman. He began repairing cars as soon as he was old enough, and now he is within a few months of compulsory retirement. That is such a long time, and for so much of it he has been boss of the repair tracks that the Pennsylvania Railroad's interest in them, if it has any, is no longer recognized, the place is invariably spoken of as "Goodman's yard."

About the first process encountered in Goodman's yard is one that is not ordinarily associated in the lay mind with car-repairing. Here is a gang of men with scoop-shovels throwing coal off a car. As they shovel they wear a look of martyrdom that ought to bring a blush to the cheek of the person responsible for the overloading of that car.

One-third of the coal-cars that come down from neighboring mines to be weighed at Altoona before proceeding to destination are overloaded; and it is up to Goodman's martyrs to lay aside their legitimate and more profitable work of repairing cars to transform a ton or so of coal from each to the ground. When the accumulated surplus amounts to a car-load they have the fun of hoisting it up by main strength and awkwardness from the ground into a car again.

Light Literature for the Car-Repairer.

That seems to be about all there is to car-repairing—main strength and awkwardness, leavened with a generous admixture of inspiration. Railroads give car-repairers a free hand, allowing them to do their work any way they please, so long as they do not delay the cars and do not make any repairs that cost money, and do each particular job in the only way permitted by the rules.

And those rules—honestly, the printed volumes containing them would overflow Dr. Eliot's justly celebrated five-foot shelf. There is a book—not a booklet, remember, but an adult 12mo, with a large and growing family of supplements and appendices—on the air-brake.

Then there is a heating and ventilating book, and a dimension book, and sundry other books, not to mention the regulations, requirements, and recommendations of the Master Car-Builders' Association, the most prolific author the country has produced. In volume of output the association is already neck and neck with the *Congressional Record* and gaining at every jump.

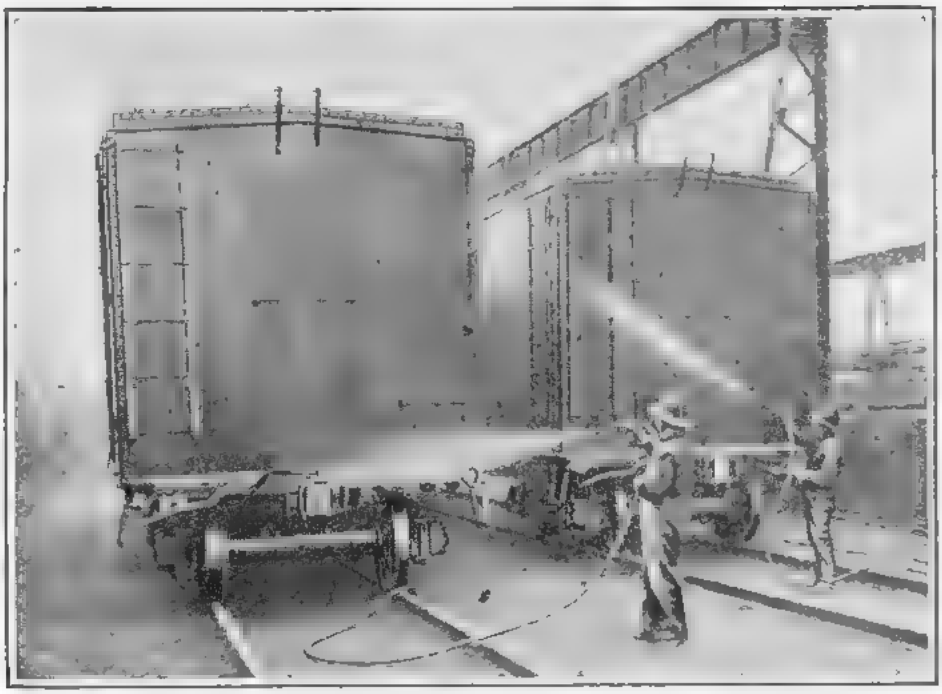
M. C. B.'s 383-Page Price-List.

Why, the official price-list of the Master Car-Builders' Association alone makes a volume of 383 pages. This price-list specifies the cost of everything that can be done to a car that may be charged to the owners by the road making the repairs, and this governs the cost on the road's own cars. As the car-repairers are paid by the piece-work system, they are naturally concerned in not putting in a dollar's worth of work on a ninety-eight-cent job.

Then there are the Federal laws and State laws relating to railroad equipment, and Interstate Commerce Commission and State Commission interpretations of these laws and regulations formulated pursuant thereto. Absolutely, if a car-repairer were to smash his thumb he would not dare voice his agony until he had consulted his reference library to see whether he might permit himself an expletive worthy of the occasion, or whether he would just have to say "Ouch!" and let it go at that.

Car-repairers heed at least one scriptural admonition: they earn their bread by the sweat of their brows. There are no electric cranes in the repair-yards to do all the lifting, nor any power-driven tools to do the rest of the work. Loaded cars must be repaired, if possible, without unloading.

It takes muscle to jack up a weight of sixty to seventy-five tons, and more muscle to replace broken couplers weigh-



IT SAVES A LOT OF TIME TO SQUIRT PAINT ON A BOX-CAR WITH AN AIR-BRUSH

ing 540 pounds and their yokes weighing 420 pounds, which must be lifted up and secured in position while working in cramped quarters. And then it is no light job to replace a pair of wheels each weighing 725 pounds, to say nothing of the axle.

Car and repair parts cannot be brought together where the work can be done with a minimum of effort. The yard is filled with cars needing attention, and it is the repair man's duty to figure out a scheme to get the pieces he wants to the place where he wants them, which may be a quarter of a mile away and across half a dozen tracks packed solid with loaded cars.

Or perhaps some part of a loaded car-body may be giving way. Then the problem is to put in some rivets or a patch without unloading the car.

Or perhaps some patriarchal specimen of rolling-stock may limp in with a broken center plate which may be anywhere from 6 to 10 inches in diameter. As the standard center plate is now 12 inches in diameter, the repair man has nothing with which to replace the broken part and the company will not buy one for him. Anyway, there are no center plates on the market 10 inches or less.

All this in no wise relieves the car-repairer of the duty of replacing that broken center plate and getting the car out of the yard promptly.

Saving the Pieces, and Using Them Over.

If you were to watch the solution of this seemingly impossible problem perhaps you might begin to understand why the company's scrap-yard adjoins the car-repair tracks, and why no watchman is ever on duty there, although it contains thousands of dollars' worth of old metal. The company refuses to honor the car-repairer's requisitions for material whenever its conscience will allow it to do so, but it dumps several thousand tons of old metal right under his nose and then ostentatiously turns its back.

In the matter of the odd-sized center plate you may presently see it fashioned

in the car-repairer's blacksmith-shop out of something looking suspiciously like a bit from an old locomotive-boiler that you just passed in the scrap-yard. In the course of a year a good many car-loads of perfectly good repair parts are fashioned out of second-hand material from the scrap-yard.

In the same blacksmith-shop that made the center plate you may see bent and battered old rods from worn-out cars bitten into bolt-lengths in a cutter driven by an old air-brake cylinder from the scrap-yard. Outside is an air-hoist made from two condemned brake-cylinders placed tandem, loading heavy pieces beyond the ingenuity of even a car-repair blacksmith to utilize into cars for shipment to the steel mills. As the home-made hoist lacks the length of stroke to lift a load from the ground over the side of a car, the track has been sunk so as to reduce the length of the lift.

When the car-repairer needs a timber to splice a wooden sill he goes out and dissects a condemned wooden car and gets what he wants. If he needs a shim or a nut-lock he does the same thing. If he needs an angle-iron for the running-board on a metal-roof car he goes to the scrap-yard for it.

Nothing is ever wasted. Nothing that can be worked over ever goes to the steel mills or the junk man.

Millions Received for Scrap.

Still, there is an end to all things earthly, and there are some things that a car-repairer cannot do. When he has gone over the scrap-yard with a magnifying-glass there is still an irreducible minimum of old truck that yet retains some value to the junkman.

In 1914 the Pennsylvania Company sold scrap material for $2,157,241, and even that was less by a round million dollars than the scrap brought in 1913. Waste paper alone sold for $19,211; oil-barrels for $22,439; old rubber for $15,222; locomotives and wooden passenger-cars for $114,326; old wheels, metals, and wrought iron for $780,000; other odds and ends, $121,997.

In addition to ordinary repairs there is a great rush this year to fit safety appliances to all cars that have not yet been supplied. No old car that passes through the yards is allowed to go until it is fitted out according to the strict letter of the law.

If, for example, the law specifies that a handhold shall stand 2½ inches from the car-body, and when applied it measures only 2¼ inches, it must be taken off and replaced with one that is exactly right.

Repairers Have Steady Jobs.

When all is said you must admit that car-repairers have steady jobs. The men in Goodman's yard have lost just two half-days in the last nine years on account of the weather.

It is healthy work, if it is laborious; and safe, too. In nine years just two men have been killed in a force of three hundred. They were under a coal-car jacking up a drop-door when some one allowed a car to run in on the track they were at work on. Both men lost their lives. Now the switches leading to repair-tracks are fitted with a special lock to which no trainman is permitted to carry a key.

Minor accidents are equally rare. There is Jimmy Hawes, for example, who has worked in the yards for thirty-six years and never was hurt but once; and that was when he inadvertently let a center plate fall on his foot. What is still more to his credit, he has never injured a fellow workman.

The growing care with which air-brakes are inspected and repaired these days is having a material effect in reducing the number of wrecks. The growing use of steel equipment is further reducing the number of mishaps; still the point has not yet been reached when wrecking-cranes can be sold for old iron.

These observations are suggested by another Goodman—Dave T.—who is also

THE SCRAP-METAL YARD, WHERE MR GOODMAN AND HIS HELP FORAGE FOR OLD PARTS WHEN THEY ARE CALLED ON TO FIX A CAR AND AREN'T GIVEN ANYTHING TO FIX IT WITH THE OLD TRUCK THAT MR GOODMAN CAN'T USE IS SOLD FOR JUNK IN 1914 THE PENNSYLVANIA CLEANED UP OVER $2,000,000 BY THE SALE OF SCRAP MATERIAL

a Pennsylvania institution. Dave has been running to wrecks for thirty-five years, twenty of them as wreckmaster, and he still "would rather take up an engine than go to a picnic"; he says so himself. It isn't often he has a chance to enjoy himself, for most of the calls made upon him are for trifling derailments in the yards—nothing a man could work up any enthusiasm over.

In this particular instance the wrecking-crew is considered a part of the car department, partly because this department has a large supply of material eligible for wreckers, and partly because there is plenty of work for the cranes around the shops, lifting machinery and the like, which enables the men to keep their hands in at such things as handling jacks and blocks.

Takes 8 Men to Work Wrecking-Crane.

The size of the wrecking-crew depends upon the magnitude of the smash-up with which they are called upon to deal. It takes at least eight men to handle the wrecking-crane, while a good many more may be needed in a serious affair.

In order to be prepared for any emergency the wreckmaster maintains a crew of forty-eight picked men. From these he takes a crew of eight in rotation, so that all are kept in training. And he has a little list from which he could recruit as many as two hundred good men at a moment's notice if they ever should be needed.

The wrecking-train consists of a crane, an "idler," or truck-and-block car, and a coach. A complete extra outfit is kept ready against possible need. Either one or both wrecking-trains can be started out of the yards in ten minutes after being notified of a wreck.

The coaches are fitted up with kitchen and dining-table; for wrecking is strenuous work and men must be well fed to stand up to it. The company sees to it that the wrecking-trains are always stocked with provisions of the first quality, and the wreckers do the rest, for every gang always includes at least one man who is a good cook.

Can Lift 10 Tons 55 Feet High.

Wrecking-cranes are handy things to have around, even when there are no wrecks to clear. Those at Altoona have extension-booms with which they can lift a weight of ten tons to a height of fifty-five feet. This is for bridge and shop work. The ordinary reach of a crane-boom is 35 feet, at which distance they can lift 30 tons; at 30 feet they can lift 60 tons. On a straight pull each can do as much as two of the most powerful locomotives.

In dry seasons water is scarce along the line. To supply the enormous quantity used it is sometimes necessary to put in an emergency pump, steam for which is furnished by an old locomotive which is simply set on rails beside the track. When the time comes to bring these locomotives in both wrecking-cranes are sent out to lift them back on the rails.

In one instance a locomotive setting thirty feet from the rails and ten feet below their level was hoisted back between the derricks, and the outfit was ready to go in just fourteen minutes after arriving upon the scene.

THE LATE JAMES J. HILL SAID:

I'm not afraid some bright young man will come along and take my place —I'm afraid he won't.

FROM THE RAILROAD MAN'S MAGAZINE.

THE BAGGAGE COACH AHEAD.

BY FRANK CONDON.

**Andy Cullinan Had a Lot to Explain to His Wife—
But No Lady Would Cross-Examine a Hero.**

FOR the benefit of all to whom it is news, the statement is made: Andy Cullinan is married. Andy is married securely and beyond hope of redemption; and in addition to that he has settled down in a white two-story house on Seegur Avenue in Kendalville, a block from the tracks of the Waterloo & Wisconsin Railroad, where he can sit on a soft rocking-chair and watch the Chicago Express pass by.

Andy Cullinan has retired from active railroading, after fifteen years in the baggage car. When he retired, it was not a modest withdrawing from the harried ranks of toiling labor. It was a skyrocket retirement. It was a retirement with bands playing, bugles blowing, banners waving and applause from the populace. These are figures of speech, but wait till I tell you.

To begin with, everybody who ever had anything to do with the Waterloo & Wisconsin knew Andy and liked him. He was and is a genuine human being and a gentleman, and some were sorry when he up and married himself to Julia Lenahan —a charming lady, to be sure, but a bit inclined to firmness. She had an unwavering chin and a habit of saying, "No."

After fifteen years in the baggage car Andy naturally began to think of the comforts of a home. He began to long for a hard-coal fire, carpet slippers, home-made bread, somebody to call him kind names and make him wear flannels in winter.

For most of his life Andy had boarded in Kendalville, and likewise Julia Lenahan had decorated the town with her presence. She was no longer in her girlhood. Neither was Andy a blushing youth. On his way to the station Andy had stopped forty-nine thousand times to pass the time of day with Miss Lenahan; consequently they were friends.

So it came to pass that Mr. Cullinan began to sit and stare out of the baggage car door, instead of thinking of his load of trunks. He began to think increasingly of Julia. She had money and a nice home. She went to church and contributed to the town's charities. She was generally regarded as a pillar of the community. And there was no doubt that she regarded Andy with a favorable eye.

FRANCINE OPENED THE DOOR AND PEEKED IN

One Sunday morning, after church, Andy dropped into step beside the homegoing Julia and remarked that it was a nice day. Ten minutes later he asked Julia whether she had ever considered marriage, and eleven minutes from the time he started he was engaged. They were married within the month.

Then came the retirement of Andy Cullinan, simultaneously with his honeymoon. Out in Kendalville they are still discussing that honeymoon.

The Waterloo & Wisconsin people were sorry to lose Andy. He was a first-class baggage man, who had lost fewer parcels, made fewer mistakes and caused less trouble than any other man in the department. His fifteen years' record was a clean one. The division superintendent came around personally to tell Andy what a valuable employee he had been and the vice-president sent a letter signed with his own name, which Andy intended to frame.

So everything was lovely as a wedding bell. The happy couple was married amid flowers. Friends said nice things to them, and Andy blushed for the first time in a quarter-century. After that they drove down to the station and started away blithely on their honeymoon.

At this point the smooth, level progress of their lives becomes a trifle ruffled.

They were married toward evening. Julia had decided to honeymoon in the West, jogging along by easy stages and deciding where they wanted to go next on the spur of the moment. It will be recalled that Julia was a firm, unyielding lady. Furthermore, she held the bankroll, which was one of Andy's first matrimonial mistakes. A gentleman upon going away on his honeymoon should always insist upon being cashier.

At any rate the west-bound Chicago Express rattled its way out of Kendalville as it had done so many times in the past. Once again it bore the vigorous person of Andy Cullinan. To be sure there was a difference. Formerly Andy had sat on a pile of boxes in the baggage car, checking up the load. Now he reclined at his ease, smoking a fifteen-cent cigar and staring at the scenery. He pointed out familiar landmarks to his new bride until the coming dusk bid the world without.

And meantime he thought occasionally of Joe Swammer, the new baggage man on the Express, who at that very moment was checking up and worrying. Andy smiled.

The Chicago Express is a fine, through train. As befits a honeymoon couple, Andy and Julia were the occupants of the finest suite on board—a suite so fine that the hot water actually ran hot water from a tap bearing the words.

The newlyweds dined in state. There was nothing shy or fluttery about them. Nobody observed that they were bride and groom and whispered facetious comment. In the course of time Julia, being elderly, decided to retire. Andy began to hunt through his suit-case for a suit of extraordinary and excessively pink pajamas. . . .

Through the sable night rolled the Chicago Express, with Joe Swammer in the baggage and express combination car and Andy Cullinan somewhere in the rear, clad in pink pajamas and most outrageously sleepless. Somehow he felt out of place and ill at ease, for as a passenger, without duties, it was almost his first experience.

After battling it out with himself he decided that he must capitulate. Force of habit was too great for him. He quietly sneaked out of his berth, cast a fearful and lingering gaze upon his slumbering bride and hunted for his carpet-slippers. Then he shamelessly passed down the aisle between the swaying curtains and moved onward toward his old friend—the baggage car.

Andy had no definite ideas. He was simply uncomfortable and desired to feel at home. He would smoke a pipe with Joe Swammer, discuss topics and then wend his way back to his compartment. Julia, sound asleep, would be none the wiser. If Joe was in trouble over the new job Andy could straighten him out in no time. Thus we have a picture of a pink-pajamaed bridegroom fleeing from his innocent mate.

Andy pawed his way on through the train. In the course of time Joe Swammer looked up with an amazed stare and welcomed the veteran.

"My gosh!" Joe exclaimed. "What's this mean?"

"It doesn't mean anythin'," Andy replied testily, "except that I can't sleep in that stuffy bunk back there. Just thought I'd hunt you up and have a smoke. How's things?"

Joe Swammer grinned.

"You're a fine bridegroom," he chuckled. "Rather ride in the old baggage car than—"

"Shut your head," Andy growled. "Gimme a pipe and tobacco. I can't stay long, because the old lady's liable to wake up and she'd probably think this queer—me leavin' this way."

As a matter of cold, historical fact, Mrs. Cullinan did awaken and did miss her new mate. But did she fly into a hysterical outburst and summon the conductor? Not at all. To her it seemed perfectly natural that Andy, possibly annoyed by insomnia, would rise and go forth into the baggage car. In brief, Mrs. Andy felt that her husband had returned to familiar surroundings and would presently reappear.

"Queer! I should say she will think it's queer," Joe chuckled again. "What's the matter with you, anyhow?"

"Nothin' except that I've traveled in this baggage car so long that I don't feel right anywhere else," Andy said, seating himself comfortably upon a barrel.

Whereupon Joe Swammer ceased from jocose comment and provided for his pink guest's entertainment. Andy sat and smoked and shivered. The baggage car was cold. In the express half ahead, the messenger dozed.

At last the train pulled into West Bancroft. Ordinarily no changes are made here; but on this particular evening, a change was made and all unknown to Andy Cullinan, who had taken up the topic of hours and work, and was informing Joe in heated terms. Meanwhile the private car belonging to and hired by the Parisian Maids was hooked into the Express, directly behind the baggage car. Presently the train started again and a few moments thereafter Miss Francine De La Vere started a private investigation of conditions on board a modern railroad train.

Miss Francine was twenty, pretty, pi-

A YOUNG LADY UNDERTOOK TO EXPLAIN TO HIM THE DIFFERENCE BETWEEN A FOX-TROT AND A ONE-STEP

quant, curly-haired and given to abrupt remarks designed to overthrow the phlegmatic complacency of male human beings.

Closed doors meant nothing in the life of Francine De La Vere, except to provoke curiosity. So presently she emerged from the private car and gazed upon the bleak and uninviting back door of the baggage coach ahead. Her companions had begun to pall upon her. Here lay opportunity for research and investigation into the habits of that queer bird, the modern baggage man.

Francine opened the door and peeked in. She beheld a citizen in a suit of pink pajamas, pointing a pipe at a man in the corner and remarking that this country had better beware if it knew what was good for it. Francine returned to the Parisian Maids and announced the tidings. There was something doing in the coach ahead. It was a roomy coach and infested by male bipeds in pink pajamas.

Now pink pajamas are invariably interesting to chorus girls. Many chorus young persons wear them for purposes of slumber. Francine's story had an interesting sound; the Parisian Maids rose *en masse*, as it were, and followed their intrepid leader.

They burst into the baggage car and surrounded the two startled occupants thereof. Large girls and small girls; brunette girls and blond girls; fat girls and slender girls; but all were young girls, bold girls, girls unafraid, girls hilarious, girls frankly critical.

They crowded noisily about Andy Cullinan and Joe Swammer. Joe blushed as a matter of habit, while Andy squirmed and tried to hide the pinkness of his pajamas behind a pile of baggage.

"Oh, see the pretty pink man!" the Parisian Maids cried, hauling Andy out into the light and pointing impertinent fingers at him.

"What nice feet he has!" remarked others, and still others observed that things were coming to a pretty pass when a bold man deliberately burst into a crowd of refined ladies, clad only in his nighty.

It was a terrifying time for Andy Cullinan. Never before in his life had he been brought into violent and personal contact with a bevy of audacious show girls. As for Joe Swammer, that gentleman, while astounded and frightened at first, had now come to regard the irruption as a lark.

It appeared that the Parisian Maids

were bored by the monotony of life on board their private car. They were satiated with it. They had had enough Pullman cars to last them for years. West Bancroft had only added to their burden of ennui.

What they were looking for now was a lively party—something different from the humdrum and partaking of the general nature of a gala period of joy. It occurred to them suddenly that the baggage car, enhanced by a queer gentleman in pink pajamas and a grinning person with a brass band on his cap, was a most excellent spot for a party.

While the prettier ones argued and pleaded with Joe Swammer, others dived back into the private car and returned with edibles and drinkables, the latter consisting of American champagne, given to them by a fatuous drummer at the last one-night stand. In spite of his pajamas and his slippers and his rosy protests, Andy Cullinan was dragged forth and a young lady with two exceedingly pretty, black eyes undertook to explain to him the difference between a fox-trot and a one-step, while another young lady played violently upon a banjo. Andy drank a beaker of the vintage from California's sunny slopes, glared defiantly at Joe Swammer, although that gentleman was not looking at him, and decided that life bore its own compensations.

Joe Swammer at the moment had totally forgotten the business of baggage transfer and was sitting enthroned on a steamer trunk between two piquant chorus girls, taking an occasional sip from their glasses and telling them a funny one he heard the last time he was in Chicago.

Thus sped the merry moments of the sable night, in a manner of speaking. In the rear Pullman Mrs. Andy Cullinan, bride that she was, slept the sleep of quiet righteousness—and the Chicago Express rolled onward into the murmuring West.

They were a sprightly lot in the baggage car—those Parisian Maids. Andy stared about him with an ever increasing interest. He forgot his pink pajamas and his bare ankles. He joined in a song or two. He sipped further the fragrant juice of the grape and told the girls the story of the two injured soldiers and the nurse.

The girls frolicked from one end of the car to the other. They demonstrated the latest dance steps. They shouted, shrieked, laughed, sang, giggled, whooped, kicked and gave imitations of Eddie Foy and George Cohan. They played banjos, clicked castanets and rattled tambourines. Three of the girls added to the inspiration of the occasion by finding an empty coffin and forcing Andy Cullinan to climb into it. As has been stated, it was a regular party.

The coffin had nothing to do with the party in the beginning. Presumably it was on its way somewhere to fulfil its usual function, but it was as yet an empty piece of baggage, now the top of the outer rough box was loose and therefore priable. So the girls pried it off and summoned Andy to play dead. Andy protested about the joke, but finally climbed in.

It was just about then that something happened. Irene—one of the girls—came suddenly into the baggage car.

"Girls," she exclaimed, "there's a woman back there and she's looking for her husband."

At the word "husband" Andy Cullinan, who had begun to wriggle out of his velvet prison, suddenly paused and paled. He was sitting upright, but he decided at once to resume his former position. He spoke.

"What's she look like?" he demanded.

Irene described the lady briefly and without ornamental phrasing.

"That's my wife," Andy gurgled.

He looked about him at the Parisian Maids. He glared at Joe Swammer. He observed his pink pajamas and thought of his ankles. Then he said nothing further, but immediately slid back out of sight, pulling the cover over him. There are some situations difficult to explain to one's bride.

"She's coming," Irene announced calmly.

Joe Swammer pushed the lid into place and an instant later Mrs. Andy Cullinan strode into that scene of ribald revelry. She was clad in a blue robe and an aureole of outraged dignity.

"Has any one seen a semibald-headed man in a suit of pink pajamas?" she asked coldly and politely, staring at the Parisian Maids in a manner that indicated plainly what she thought of them.

"No, ma'am," Irene answered with equal politeness. "This is the baggage-room" .

"It certainly is," Mrs. Andy retorted frigidly, "and full of baggages, too."

Which, when you come to think of it, is pretty fair offhand repartee.

She embraced the smiling carful in a cold glare and turned about. When she had gone her embarrassed husband was released.

"A party is a party," Andy said, sitting up, "and I'm much obliged for letting me in on it. But right about now is where I quit. You can get a divorce for less than this, and I've only been married six hours."

After that the party indicated signs of rapid decay. Andy's sole desire was to return at once to the bosom of his family—to crawl into his berth in a noiseless and undiscovered manner.

He regretted his former restlessness. He regretted the party and he wished the merry Parisian Maids had taken another train. He almost regretted being married, at the moment . . .

And about that time, something astounding occurred to the Chicago Express. They still call it, on the W. & W., the Henderson hold-up.

There was a sudden grinding of the brake-shoes and a squealing of the wheels and the Express came to a swift stop. Outside was the report of revolver shots and the shouts of men. Somebody ran alongside the baggage coach, yelling an order. The occupants of the train heard the crunching of gravel. More shots. More shouts. A tall individual with a black rag over his face burst into the baggage room and pointed an automatic pistol at the Parisian Maids and Joe Swammer.

"Anybody that moves 'll be killed," announced the person. "That goes for everybody. Keep your mouths shut and don't move from where you are."

Then he vanished. He slammed the door shut behind him. There was no need for him to urge inaction upon the occupants of the baggage car. They were rooted. They were also largely affected by a sudden palsy, which caused their limbs to tremble and their teeth to chatter. Two maids took occasion to faint immediately and they toppled gently to the floor, where they remained, without having attention paid them.

Joe Swammer sat perfectly still, opening and shutting his mouth, from which issued no noise. In the express section of the car they could all hear gruff orders and then—silence.

Andy Cullinan alone had disappeared from the scene of action. He was totally invisible, for at the moment he reposed snugly inside the friendly coffin, with the velvet top down over his nose.

"This," he was muttering in a smothered voice, "is a deuce of a thing to have happen to a honeymoon."

The bandits were fast workers and their plans were carried out smoothly. They uncoupled the baggage car from the private car of the Parisian Maids, splitting the train. The forward section of the split, consisting of the baggage-express car and the locomotive, was ordered ahead.

One brigand stood in the engine cab with a ready automatic and the others had taken command of the express messenger, whom they subdued without shedding his blood, after which they gagged and bound him to the steam pipes. Then they burst open the communicating door and glared savagely in upon the already palsied occupants of the baggage department.

Joe Swammer was ordered to his feet. He was warned that at his slightest sound

he would die suddenly. Joe assured the hold-up men in shaken tones that so far as he was personally concerned vocal utterance was a thing of the past. He felt that he never cared to speak again.

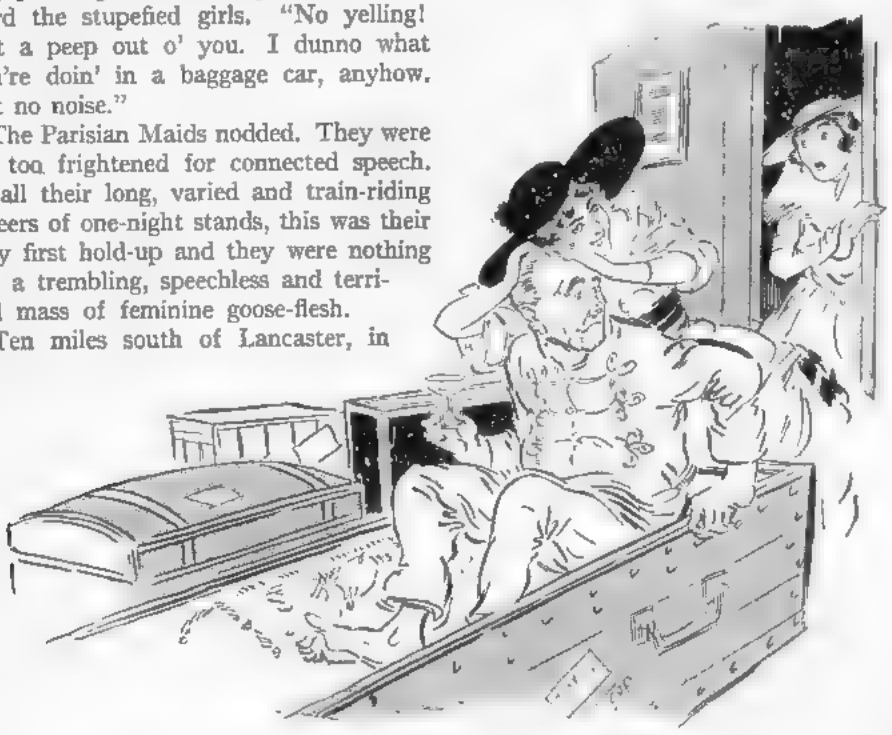
"And you dames!" continued the robber, pointing his wavering automatic toward the stupefied girls. "No yelling! Not a peep out o' you. I dunno what you're doin' in a baggage car, anyhow. But no noise."

The Parisian Maids nodded. They were far too frightened for connected speech. In all their long, varied and train-riding careers of one-night stands, this was their very first hold-up and they were nothing but a trembling, speechless and terrified mass of feminine goose-flesh.

Ten miles south of Lancaster, in Henderson County, the Waterloo & Wisconsin passes through a thickly wooded knoll. Here was the spot selected by the disciples of Jesse James for final work on the express safe. That solid object contained packages of gold coin and bills and the train-robbers knew it. During the short run west, from the point where they had taken possession, two of the men had worked at the safe, while the other rifled the express bags, finding little of value.

The gentlemanly bandit in the locomotive ordered a sudden halt and the commandeered train stopped. The engineer, fireman, Joe Swammer and the Parisian Maids were bruskly ordered forth into the night. Presently they lined up beside the track in the moonlight, holding their hands aloft like ghostly figures.

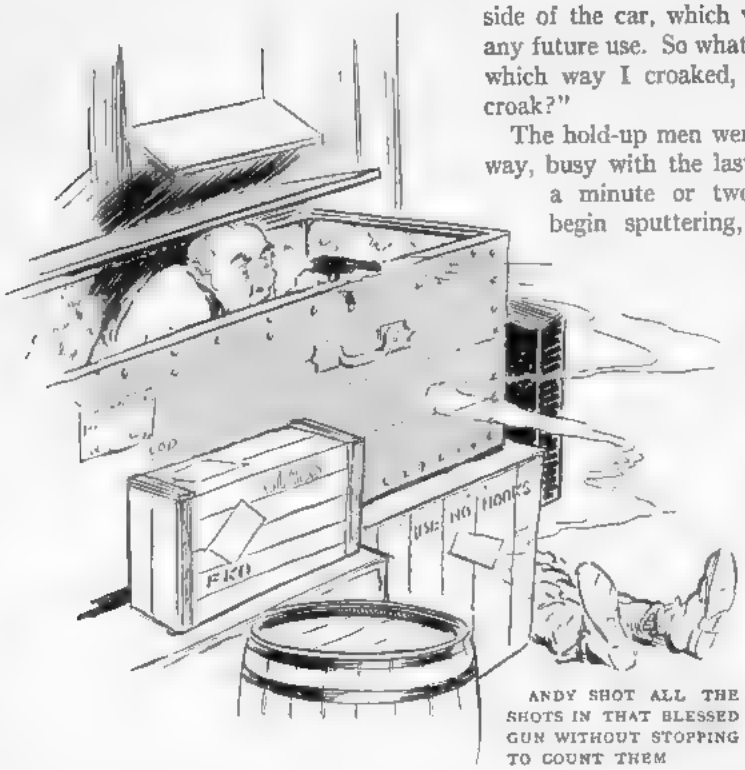
Somewhere off in the distance a waiting motor-car indicated the thoroughness of the bandits' plans. There was nothing to do but blow open the safe, remove the precious stuff, climb into their machine and vanish.



IT WAS JUST ABOUT THEN THAT SOMETHING HAPPENED.

In the express compartment the three looters were priming the safe. One of them began hauling in trunks from the baggage section, ranging them about the safe to ease the force of the explosion. They were working rapidly. Outside, the motionless line of Maids and men stood with upraised arms. In the distance the robbers' car hummed impatiently.

And in his private and personal coffin Andy Cullinan breathed softly and wondered whether death was at hand. The end of the box in which he reposed lay at the door between the baggage and express rooms. Andy heard the outlaws



ANDY SHOT ALL THE SHOTS IN THAT BLESSED GUN WITHOUT STOPPING TO COUNT THEM

working. Presently he decided to risk one peep. He softly raised the velvet roof of his prison and looked out through a space of one-half inch.

Unaware that coffins may sometimes contain objects still animate, the marauders toiled swiftly. The one who was shifting the trunks paused, his leg rubbing Andy's retreat. He carried on his hip a large and impressive automatic pistol, and as it interfered with his manual labor he removed it and placed it on the corner of a steamer trunk. When Andy took his second peep, his eyes rested upon the shining blue butt of the automatic. It was approximately seven inches from Andy's nose.

The way Andy afterward explained it was thus:

"I felt that I was goin' to be killed, no matter what happened. They were gettin' ready to light that fuse. When she blew up, the chances were that my coffin and I would be blown straight through the side of the car, which would ruin me for any future use. So what was the difference which way I croaked, if I was goin' to croak?"

The hold-up men were facing the other way, busy with the last preparations. In a minute or two the fuse would begin sputtering, and the end of the express safe was certain.

Andy gently raised the lid and squirmed around to a position on his side. He raised his right arm gingerly and the lid rose still higher. Then he poked his hand through the opening.

Still the burglars remained with backs to the coffin.

Andy's fingers closed over the automatic, and the time for shooting arrived.

Andy shot all the shots in that blessed gun without stopping to count them. The baggage room filled with the acrid smoke. Outside Joe Swammer and the locomotive men jumped into action. All three safe-blowers curled on the express car floor, with bullets in various parts of their persons or holes through them. The man on guard turned and the fireman jumped him; and when Andy saw again, through the thinning smoke, he crawled out of his lair and took charge of everything.

He had shot low, not on purpose but because of a faulty aim. The result was fortunate for the dynamiters. They were wounded, but not fatally. The man outside put up a brief fight and shot the fireman through his shovel arm, but he was a prisoner and the fireman was pounding him with the butt of his own gun. Presently the motor-car and its driver decided that all was not well. Its engine

roared and its lights began to skim through the trees.

When the engineer of the Express climbed into the car, he found Andy stepping over the prostrate forms of the robbers, threatening to kill the first one who moved. And outside, in the moonlight, the Parisian Maids, deciding that the evening was over, so far as they were concerned, sped through the night, shrieking. They had no definite goal, except to get as far away as possible from a train that evidently had been intended for a mad-house.

Then came hurried telegraph messages, a sheriff and his underlings and a special train, made up at Lancaster.

At midnight Andy Cullinan was an ordinary, elderly man, beginning a quiet honeymoon. Some time early the following morning the same Andy was a railroad hero. Already officials were being notified that the Chicago Express had been held up, but that through the "unprecedented heroism"—that's what they called it—of Andy Cullinan the valuable contents of the express safe had been saved and four of the bandits were captured.

It was a big night for Andy. The only thing that bothered him, as he stood in the train-shed at Lancaster, shivering slightly in his pajamas, with a coat over his pinkness, was the whereabouts, thoughts and intentions of one Mrs. Andy Cullinan, who might not understand, or—worse yet!—who might.

The bride and her new husband were reunited some time that morning, but not until she had read something in the newspaper—not all the facts, of course, but still something. Her Andy was a brave man and a hero. The reporter said so, though he said nothing whatever about the coffin, the Parisian Maids or the tango festivities.

"Hero!" Andy grinned, reading a headline. "Ha! I'm about as much of a hero as a dish of boiled prunes. I saved my skin and that's all. Still, the hold-up came in handy, because otherwise I have a suspicion that Julia might think something wrong about the whole thing."

What Julia thought did not matter. She embraced her husband publicly and handed him a full suit of clothes. Later on he explained the incidents of the night, vaguely, hesitatingly, disconnectedly, as befits a hero.

It appeared, from what he said, that he had always had a suspicion about bandits and that he had taken them unawares by appearing in his pajamas. He made it seem to Julia that when one goes out capturing train-robbers one invariably dons pajamas. Anyway it was a cheesy story, full of imperfections; and if Julia had been suspicious she would not have believed it.

Two weeks later Mr. Andrew Cullinan of Kendalville received a letter from the general manager of the Waterloo & Wisconsin Railroad. In it was a check that made Andy's eyes bulge and an appreciation.

The letter said many nice things. It praised Andy's courage until he blushed. It called attention to the fact that not many men would have acted with such instant heroism. It referred to the valuable contents of the express safe. And it intimated that if at any time in the future Mr. Andrew Cullinan wanted a favor from the W. & W., all he had to do was to mention it.

But did it mention Parisian Maids?

It did not.

THE CLAIM-ADJUSTER SAYS:

If you aren't paid for talking, don't talk!

FROM THE RAILROAD MAN'S MAGAZINE

FROGS.

Of every hundred men who start work as firemen only seventeen become engineers.

The railroads of the United States employ 67 telegraph codes, including 27 special codes.

On an average, the American railroads get seven mills for hauling one ton of freight one mile.

Forty railroads in this country use oil for fuel, and they burned 37,000,000 barrels last year, as against 30,000,000 the year before.

The locomotives of the United States use as much water as runs in the Ohio River at Wheeling when that stream is at its low level.

The Pullman Company has a profit-sharing plan for employees, selling its stock to them at about $10 a share less than market price and on a long-time payment plan.

The United States has one-third more miles of railroad than all of Europe, but the capital cost of it was only sixteen billions, while the railroads of Europe cost twenty-five billions.

One man operating the newest type of steel ore-car can dump a 52-ton load, close the doors, and make the vehicle ready for the return trip to the mines, all in 35 seconds.

In theory, a scoop of coal weighing fifteen pounds will develop 150,000,000 foot-pounds of steam. In practise only one-twentieth of this is available for use. The remainder goes to waste.

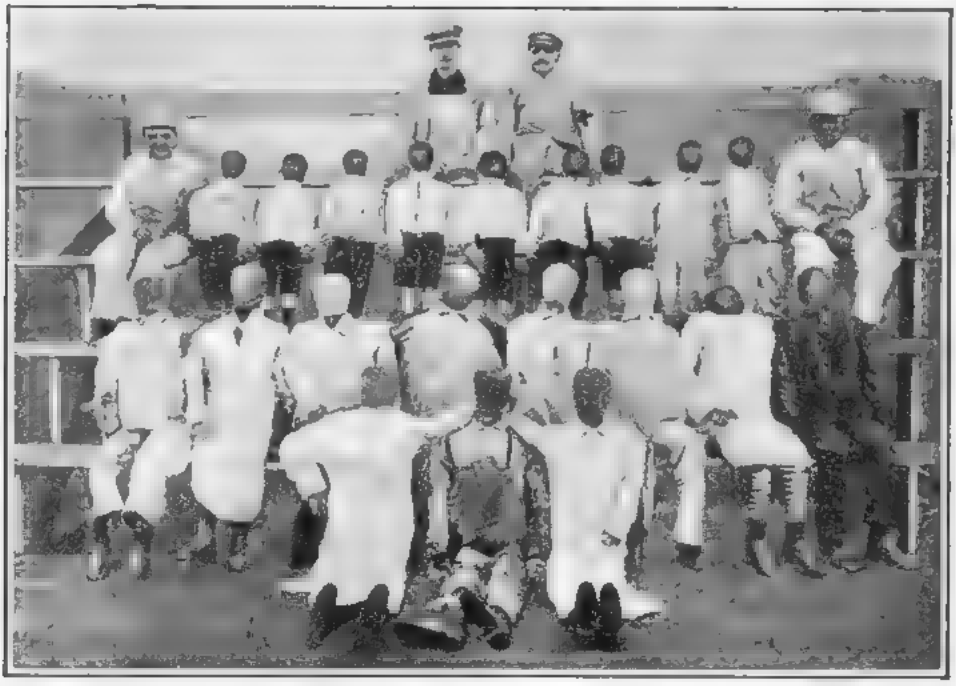
Central Pacific car No. 83622 left the Southern Pacific's rails on January 1, 1909. It did not come home again until May 13, 1916—7 years, 4 months, and 12 days later.

There are 260,000 miles of railroad in the United States. This includes about 30,000 miles of second main track, 2,700 miles of third main track, and 2,000 miles of fourth main track.

In the last five years the railroad mileage of Canada has increased nearly eleven thousand miles. Canada now stands fourth in mileage, surpassed only by the United States, Russia, and Germany.

Judge Van Valkenburg, of the United States district court at Kansas City, has declared that "It is the duty of a railroad to the public it serves to protect its patrons by discharging men who use intoxicants."

CAR VICTIMS THAT NEVER SUE.



THIS is not a meeting of one of those boards of dummy directors about which you have read. It is, to be sure, an aggregation of dummies, but they are are useful creatures which work without pay and never vote for a resolution with which they are not familiar.

The dummies are employed by the surface car companies of New York to educate motormen. The safety first campaign would not be complete without these patient pets. Every day they are brought from their dormitory, neatly clothed, and when a green motorman comes along on one of the practise trolley-cars, a sly instructor sneaks behind a tree with a dummy and throws it on the track. If the motorman's reflex is good (which means that his hand responds instantly to his brain), he stops his car before it hits the pale, prone dummy.

If the motorman is nervous, or has his thoughts too firmly fixed on his cottage at Newport, he runs over the dummy, and his promotion to actual service is postponed. As for the dummy, the company settles with it by sewing on its leg or head and buying it a pair of new trousers.

Four of the characters in the picture are not dummies, but regular humans who act as guide, mentor, and friend of the dummies. The one with the cross on his left arm is the chief surgeon. It is he who picks the wounded dummy from the pool of sawdust in which it welters and nurses it back to life.

It will be observed that the dummies are clothed as men, women, and children, there being ten children and ten adults. The men who run the dummy department take pride in making the child dummies as realistic as possible. Wild-running kids are the bane of a motorman's life, and unless the new man gets used to the sight of a child falling in front of his car he is likely to have stage-fright when the tragic moment comes. That is why the child dummies look a good deal like children, while the grown-up dummies look like—dummies.

BEFORE THE TRAINS COME.

Civil Engineer of Real Life Is Unlike Him of "Reel" Life, Though Former Has Even More Exciting Adventures.

BY GEORGE W. FOSTER.

SIX feet of sterling young manhood; eyes of hazel blue; thick, wavy hair; the indomitable chin of a long line of blue-blooded ancestors. Single-handed he fights landslides, half-breeds, floods, and strikes, bores a tunnel through a few miles of mountain, and eventually wins the heart and hand of the beautiful daughter of the president of the road. This is the civil engineer in the movie film.

What He Actually Looks Like.

Five foot seven of average Yankee; gold-bowed glasses; a gradually thinning thatch of straight hair; chin usually partially obscured by a few days' growth of wiry beard; he works all day, and every day, peeking through a transit, and works half the night figuring out the results; receives periodical growls from the main office concerning his lack of progress, and in the end receives a scowl from the rear-platform of the old man's special as it rolls along over the completed road. This is the real civil engineer.

When a railroad is to be built, its general route or location is probably decided upon by the men who are furnishing the money. By their decree the line must start in the city of Wazzis, pass through the cities of Yonkers and Naples, terminate at Perdu. All that remains for the engineer to do is to build it there. His ideal would be to build the line absolutely straight and level; but, in common with other ideals we have met, it is usually impracticable.

Perhaps a few of the advantages of such a line over one of ups and downs and curves can be seen best by the use of figures. On a straight and level track the draw-bar pull on a moderately moving train is about six pounds per ton; on a one per cent. grade—one rising fifty-three feet to the mile—the same pull is increased to about twenty-six pounds; while on a ten degree curve—five hundred and seventy-three feet radius—the increase is to about twelve pounds.

In addition to this increased draw-bar pull, a curve tends to shorten the life of both the track and the equipment—the rails on a curve wear but one-third as long as on a straight track, while the average curve takes as much out of the locomotive as twice its length of straight.

Having had these fundamental facts driven deep into his head by years of training, the engineer sets out to build his line as near to his ideal as the lay of the land will permit.

First "Survey" Not a Survey.

His first active step is a so-called "reconnaissance survey," which is really not a survey at all, but rather a critical observation of the country through which the road must pass. If the country is hilly or mountainous, the choice of a location is usually governed by the positions of the passes or low places in the hills, or perhaps by a convenient narrow place where

a river can be spanned more economically than at any other point.

Assuming that the ends of the line are in valleys separated by a range of hills, the logical location would be through the nearest notch in the hills. The distance from the ends to this notch are roughly determined from existing land maps, by the speedometer of an automobile, a pedometer carried by a walking man, or even by a rapid chain-survey. Then the difference in elevation or height above sea-level is obtained by the use of a barometer.

If the notch is found to be twenty miles from each end and four hundred feet higher, an average grade of four-tenths of one per cent is had—a grade which is by no means exorbitant. If it is found to be considerably higher, this route may be rejected because of the prohibitive grade thus formed; in which case a longer line through a notch farther away must be sought. Failing to find this, a tunnel through the narrowest place in the hills may be the only available route.

Cost Estimates Surprisingly Close.

Once the general points of the line are thus determined, the reconnaissance man further roughly establishes the balance of the route with reference to the avoidance, wherever possible, of stream and highway crossings, and of known rock-deposits where cuts would be required; also he attempts to cut through a town or city in such a manner as to give a maximum of service with a minimum of property damage.

From this preliminary survey a surprisingly close estimate of the whole cost of the line can be compiled by an experienced man—so many bridges of such a span, so many miles of "hillside" location, so many miles through meadowlands all carefully analyzed and compared with the cost of already constructed work under similar conditions.

It is at this stage of the game that many, many a railroad has breathed its last, for the original promoters of the average road are generally very optimistic in the early stages of the game, and are quite apt generously to underestimate the cost of the proposed line. Later, when the expert flashes a set of figures about double their own, the optimism fades—and also the projected railroad.

But if the road survives this crisis, the next step is the actual location survey, an honest to-goodness survey made by a good-sized party of instrumentmen, levelmen, draftsmen, rodmen, chainmen, and axmen

Location Survey Makes Map of Route.

This survey is made to cover a strip five hundred to a thousand feet wide along the line selected by the reconnaissance man. Field-notes are taken from which to make a map showing all roads, streams, fences, buildings, *et cetera*, included within the desired strip; as are also the elevations or heights of all points within the survey.

These notes are drawn up each night in such a way that a trained man can tell by a glance at the map just what the height of any certain point is, which way the land is sloping, or any other information which he may desire to have.

Starting at one end of this map, the proposed line is gradually sketched on. Perhaps a mile from the beginning is a river which it is desirable to cross at a certain level, while between the starting-point and this river is one ridge and two little gulleys or valleys.

Problems of "Cut" and "Fill."

It is desirable to cut just deep enough into this hill to furnish material to build the two fills, and at the same time have a steady grade throughout the mile. In trying a straight line it is found that the material taken from the cut will be more than is needed for the fills, but by crossing the ridge at a point where it is lower—a hundred feet to the right or left—the cut and fills can be made to come out even. The problem is to figure the exact curve to use to cut through the hill at the exact point to attain this result.

Or, in another case, a gradual ascent must be made from the foot of a valley to the upper end. Here the problem is to carry an even grade from the bottom to the top by winding along up the valley in such a manner as to take the greatest possible advantage of the lay of the land.

Assuming that at some point the figured railroad-grade is thirty or forty feet above the floor of the valley, if there are no cuts near from which to obtain material for such a fill, the usual practise is to swing over into the side of the hill which skirts the valley, and there wind along the slope, cutting just deep enough into the side of it to furnish material for such fills as may be needed.

Must Figure on Drainage, Too.

In another instance the line cuts through a hill in such a way that it would be possible to have the road-bed level. But this would never do; if the cut is of any appreciable length, the road must slope either one way or the other to insure proper drainage.

If a tunnel is to be built, the mountain must be literally bisected, trisected, intersected, crossed and recrossed in such a way as to obtain a survey that "checks out" with such a degree of absolute accuracy that borings started from each side will meet with a variation of but a fraction of an inch. This was the case in the building of the longest tunnel in America, when the two ends of the shaft met under Hoosac Mountain after years of digging.

And so it goes, no two cases just alike, and the simplest case enough to make an untrained man dizzy. Plugging along over the landscape from dawn to dark, and often figuring from dark until the wee small hours of the morning, slowly the civil engineer fights his way to the projected terminal.

After locating the line on the map, there still remains the job of locating it on the ground. There the stakes must be set every hundred feet along the center line, and each one must be marked to show the amount of cut or fill at that point.

Perhaps the stake-driving will be progressing nicely and the skies be bright and sunny, when suddenly the stakes veer sharply out into space and plunk down in the middle of a river somewhere. All hands agree that something is radically wrong, yet no one is quite sure what it is, until the figured notes of the last curve or two are carefully rechecked and the notes of the original survey are gone over until you discover where some heavy-eyed mortal has copied an angle wrong at two A. M., and then shuffled off to bed without checking his work. If the guilty party is present, he is reproached; if absent, he is reviled; and the work proceeds along amended lines.

But for all that, in fairly well-settled and moderately smooth country, a location job is by no means unbearable. Decent board can usually be obtained at villages or farms, and the actual engineering problems encountered are not apt to be particularly weighty. It is the unsettled and mountainous country that really tries the soul and body of the engineer.

Camp Life in Wild Country.

There camp life is the rule—usually with an inadequate supply of second-hand tents and a cook who can't bake a potato without having it stick to the pan. Hampers of baker's bread, buckets of lard, chunks of salt hog, with their complement of spuds, beans, coffee, *et cetera*, come jolting in on burrows; and between the cook and the burro the whole outfit is usually rendered absolutely unpalatable before it reaches the table. Generally the bread escapes; but not invariably—once in my lifetime, and perhaps once or twice before, a four-legged, long-eared limb of Satan has been known to topple wrong side up in a brook with a week's supply.

Aside from the element of discomfort, there is more or less real personal danger in mountain location. Setting up a transit along the side of an almost sheer cliff is no job for a tenderfoot, and more than one good man has gone crashing to his death thereby.

The most peculiar and mysterious tragedy of recent years along this line was probably the loss of a man named Keenan in nineteen-twelve, on the survey for the proposed electric line up Mount Washington. He was sent back about two hundred yards to give a sight, and before he could rejoin the party a storm swept over the mountain. What became of Keenan was never learned. He disappeared utterly, and though a constant search was carried on for weeks, no trace was ever found.

But even though a life is lost now and then, the work still goes on; the stakes are driven, the cubic yards of each cut and fill are figured, test-holes are drilled to determine the nature of the earth or rock to be moved, bridge abutments and passing-tracks are staked out, bridge stresses figured, water-tank sites determined, and the amount of land to be required estimated; the lawyer-engineer dickers for the needed land, and the contractors sharpen stubby pencils and figure construction estimates.

John Smith's Priceless Farm.

The obtaining of the land for the right-of-way is a game in itself, for when a rumor of a railroad is breathed aloud, land values go a soaring. John Smith's farm—listed for taxes at ten dollars an acre—becomes priceless overnight, and all of the tact and patience in the world are required to do business with him. Once in a lifetime he will deed over the right-of-way strip for a reasonable sum, but more often he will hold up the company outrageously, and not infrequently his land has to be taken by court proceedings.

Coming to the actual construction, this work is generally done under contract by the lowest reputable bidder, and frequently is greatly subdivided—one concern doing the grading, another building the masonry culverts and bridge abutments, while another builds right-of-way fences, another furnishes ties, and so on down through the list.

Engineer's Many Duties.

The part that the engineer plays in construction is a busy one. He must keep the grading absolutely within bounds—no easy task when a bunch of Italians pull up a mile or two of stakes for kindling wood or a steam-shovel kicks out a bunch of them; he must measure separately the amounts of earth and rock—for different prices prevail for removing each; he must test the cement used in masonry work, inspect the stone used, and see that mortar and concrete are properly mixed; test the rivets and steel of the bridges; see that contractors do not encroach on non-railroad property; run lines for fences; prepare the monthly estimates by which the contractors are paid; inspect all ties and superintend their installation, together with that of the rails; see that the grading is carried on in such a way that a sudden freshet will not destroy the work of weeks; rushing from one end of the job to the other, unshaven and unshorn, through the rain and mud, dust and heat, and generally for about half the pay that the contractor's walking-boss receives.

If things go wrong, he is to blame, and his professional prestige suffers; while if he rushes the job through to a successful completion, he is turned adrift at the end to find his next pay-check where he may.

But through thick or thin, for better or for worse, he would not change for any other profession on earth; once an engineer, always an engineer—perhaps not always true to the type of man whom the movie-scenario writer marries unto the president's daughter, but nevertheless a true-hearted gentleman for all that.

OPERATOR'S "FIST."

The Telegrapher Must Still Write a Good Hand if He Wants to Be Considered a "Star."

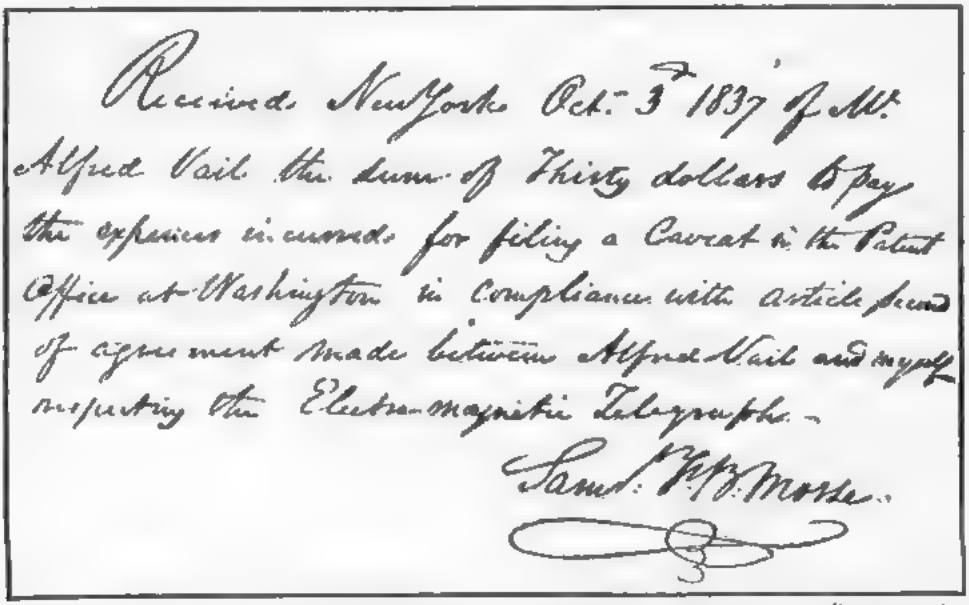
BY DONALD McNICOL.

THE highest compliment one operator can receive from another is that conveyed in the remark: "You write a copper-plate hand," or: "You write a pretty quill."

Walter P. Phillips, the author of Phillips's Code, once stated that the Canadian telegraphers who migrated to the large telegraph centers in the Eastern States during the early days of the art, at once set the styles in the famous loops and curves which characterize that type of penmanship generally recognized as the "telegraph hand." Mr. Phillips has a legitimate claim to high standing as an authority, for in the heyday of his youth he was awarded a valuable gold pen by Professor Morse for having copied in a beautiful hand a record number of words from the wire in a given time. As Mr. Phillips himself has quoted, the penmanship of an expert telegrapher is "a thing of beauty and a joy forever."

How the Shop Expresses Itself.

If you inquire of an operator regarding the ability of another operator to write well, the reply is likely to be: "Oh, yes. He can draw pictures"; or in case the man inquired about is not a good penman, the statement may be forthcoming

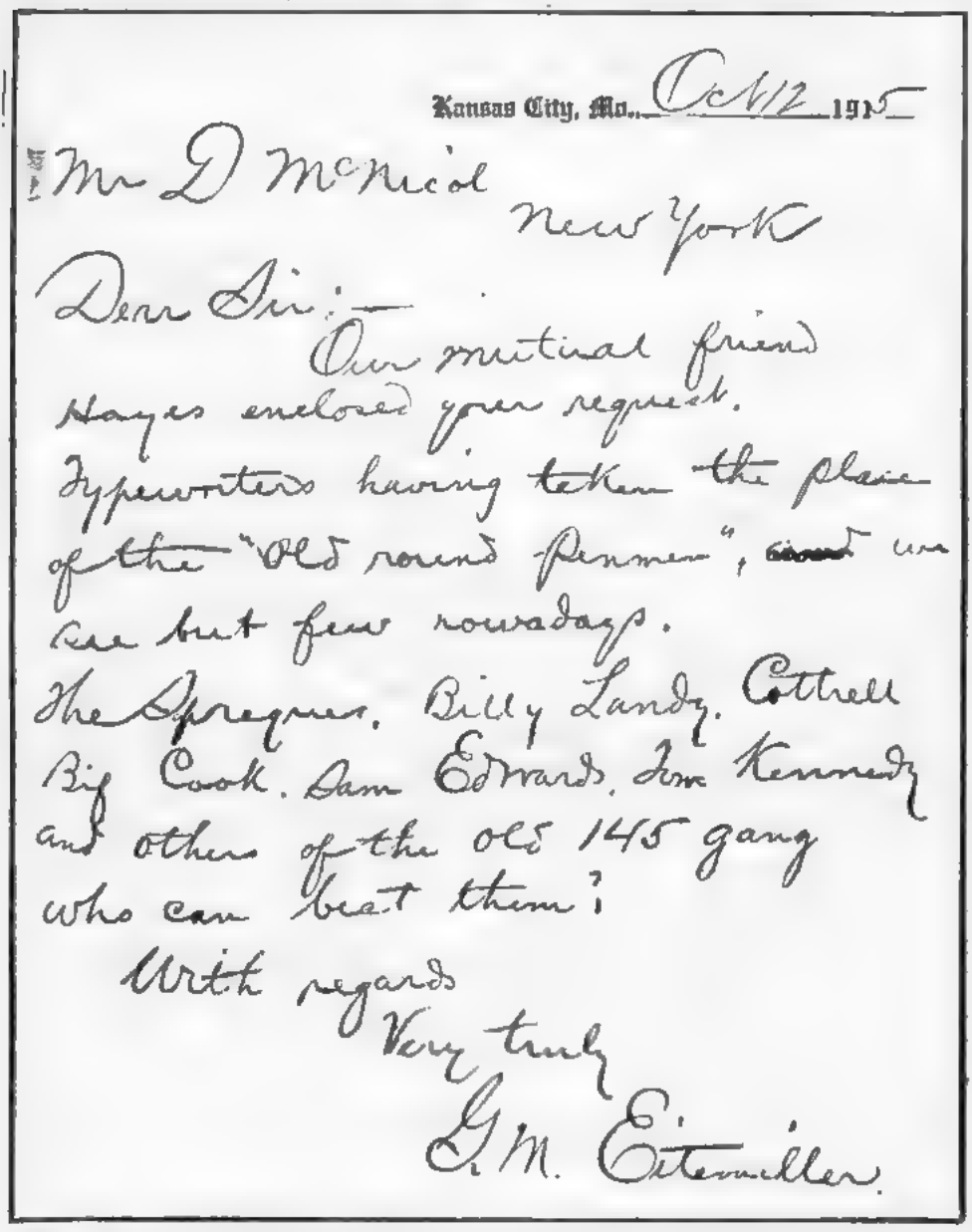

Received New York Oct. 3d 1837 of Mr. Alfred Vail the sum of Thirty dollars to pay the expenses incurred for filing a Caveat in the Patent Office at Washington in Compliance with article second of agreement made between Alfred Vail and myself respecting the Electro-magnetic Telegraph.

Saml. F. B. Morse.

THE INVENTOR OF THE TELEGRAPH APPEARS NOT TO HAVE BEEN THE FATHER OF "OPERATOR'S FIST," FOR IT IS EVIDENT THAT HE DID NOT WRITE WITH THE FREE-ELBOW MOVEMENT WHICH RESULTED IN THE LARGE CAPITALS AND FLOWING TAIL-PIECES AFFECTED BY LATER BRASS-POUNDERS.

that: "He writes a rotten fist." An operator who uses a stub pen and writes

and who later in life have entered other pursuits, always take pride in their pen-



Kansas City, Mo., Oct 12 1905

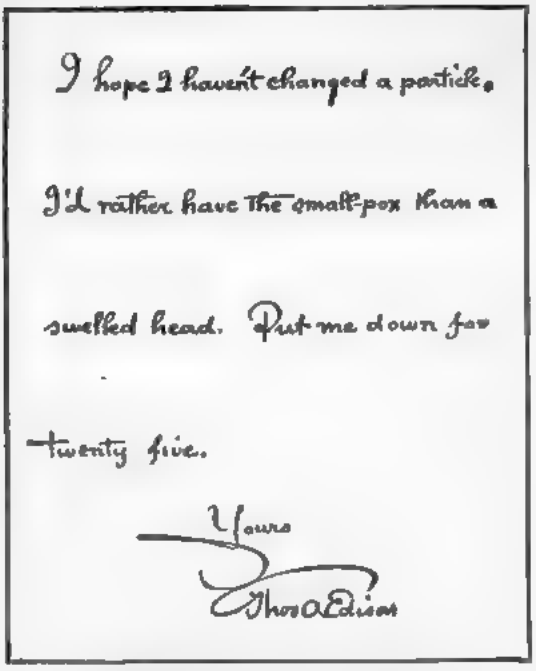
Mr D McNicol
New York

Dear Sir:—
Our mutual friend Hayes enclosed your request. Typewriters having taken the place of the "old round penmen", and we see but few nowadays. The Sprogues, Billy Landy, Cottrell Big Cook, Sam Edwards, Jim Kennedy and other of the old 145 gang who can beat them?

With regards
Very truly
G M. Eitemiller

THE WRITER OF THIS MESSAGE, IN HIS PRIME, COULD PEN HOUR AFTER HOUR AT THE RATE OF FIFTY-FIVE WORDS PER MINUTE MR EITEMILLER IS ONE OF THE MOST EXPERT TELEGRAPHERS WHO FLOURISHED PRIOR, AND ALSO SUBSEQUENT TO THE ADVENT OF THE TYPEWRITER

a heavy hand is said to "put it on with a broom." Telegraphers who have been capable of producing a "gilt-edged copy," manship, and it is with pardonable conceit that they never lose a chance to display their graceful chirography.


I hope I haven't changed a particle.
I'd rather have the small-pox than a
swelled head. Put me down for
twenty five.
Yours
Thos A Edison

MR. EDISON'S HANDWRITING, LIKE THAT OF PROFESSOR MORSE'S, IS NOT TYPICALLY AN OPERATOR'S. IT IS BEAUTIFUL AND LEGIBLE, BUT NOT MANY TELEGRAPHERS COULD LEARN TO WRITE IT FAST ENOUGH

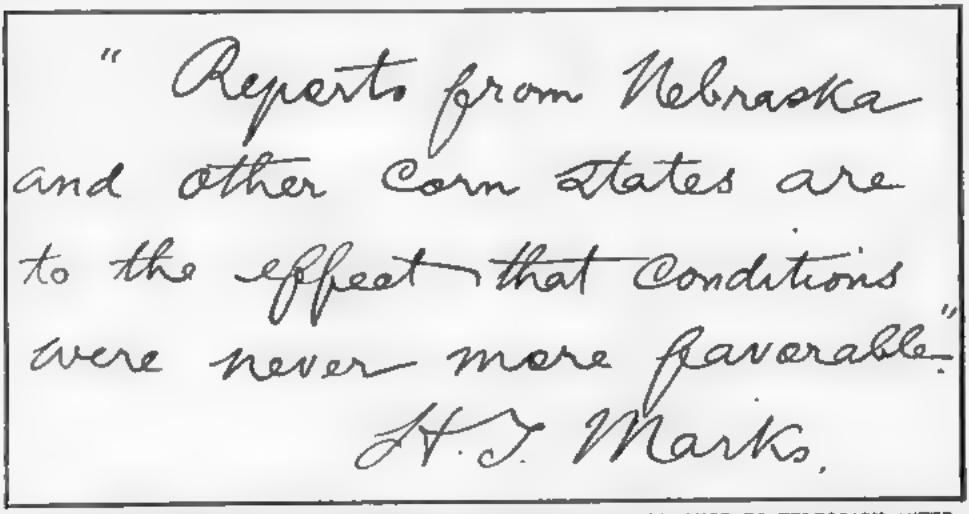
In every town and city of any consequence between Sandy Hook and Cliff House one may to-day see that attractive legend, "Did you ever stop to consider," *et cetera*, engrossed on plate-glass windows, the original of which was written by a vice-president of one of the large telegraph companies in a strong, legible hand, typically telegraphic.

Is in a Class by Itself.

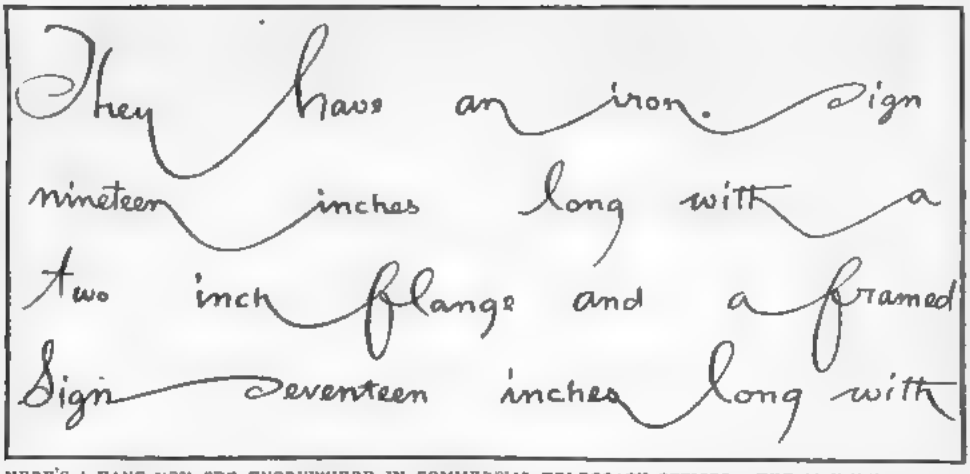
Telegraphic penmanship is not taught in schools or colleges. Its characteristics are not Spencerian. To the lay eye all telegraph hands look alike, but to the initiated there are many variations of form and style.

Of course, the typewriter is at the present time universally employed in receiving messages from the wire, and due to this a condition has grown up wherein it is conceded that a man now may be a first-class telegrapher without being able to "sling the ink" in graceful lines. It is true, however, that every telegrapher who aims to be known as a "star" realizes that a plain, rapid penmanship is essential.

It is no uncommon sight in a large operating-room to see a number of operators grouped around a message-hook upon which is hung, awaiting transmis-


"Reports from Nebraska
and other Corn States are
to the effect that Conditions
were never more favorable."
H. J. Marks.

THIS TYPE OF CHIROGRAPHY IS WRITTEN BY AN OPERATOR WHO LEARNED TO TELEGRAPH AFTER THE TYPEWRITER WAS INTRODUCED IN COPYING MESSAGES. COMPARE IT WITH ANOTHER SPECIMEN OF THE SAME SCHOOL, WHICH APPEARS ON THE NEXT PAGE.



HERE'S A HAND YOU SEE EVERYWHERE IN COMMERCIAL TELEGRAPH OFFICES. THE MAN WHO WROTE THIS CAN "TAKE" WITH EQUAL FACILITY ON TYPEWRITER OR WITH PEN AND INK. STATISTICIANS HAVE NOT YET BEEN ABLE TO FIGURE HOW MANY EXTRA BARRELS OF INK HAVE GONE INTO THE MAKING OF THOSE LOOPS LINKING UP SEPARATE WORDS.

sion, a message written by hand by a new recruit from the bush league who knows how to "put it down in style." A group of artists viewing a Meissonier, a Rembrandt, a Bonheur, or a Blakelock could not voice homage more appreciative of their masters than is offered by the telegraph cub to those of the craft who can produce "copper-plate" copy.

It has often been stated that the first operators adopted a style of penmanship resembling that of Professor Morse, and that from this was evolved the typical telegraph hand with which we are familiar. The specimen of Morse's handwriting herewith reproduced differs markedly from the average school or business hand, but it is evident that Morse did not write with the free-elbow movement necessary in producing the large capital letters and flowing tail-pieces affected by later operators.

Present School Founded about 1865.

I have a number of specimens of penmanship written by operators between the years 1845 and 1865, and not one of them bears close resemblance to the modern telegraph hand. Commencing about 1865, however, it would appear that some telegrapher with an artistic bent developed a style of penmanship at once plain and rapid and rounded out in lines pleasing to the eye.

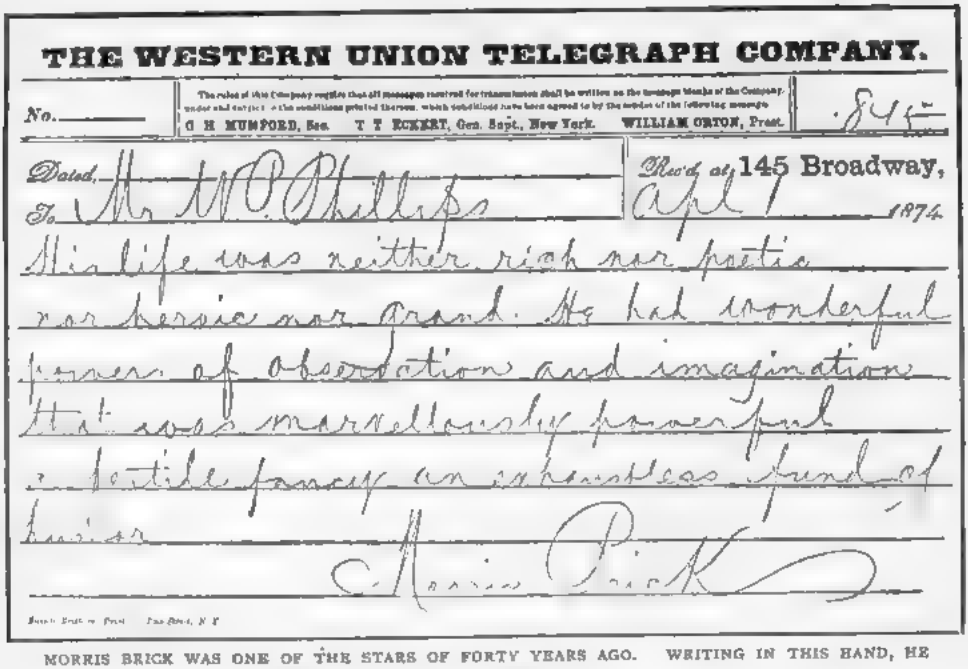
From that time onward improvement was quite noticeable. Telegraph companies and railroad companies gave preference to operators who could write plainly and rapidly.

It may well be imagined what "rapidly" meant when train-orders had to be copied at a rate of thirty-five to forty words per minute, and when commercial telegrams had to be copied in readable lines from senders who made no allowances of time for such purely local operations as dotting "i's," crossing "t's," dipping ink, blotting finished copies, adding in service marks, reaching for service forms, *et cetera*.

Most people can write their best when they write slowly and carefully, but a good telegraph operator generally writes more gracefully at thirty-five words per minute than at fifteen words per minute.

Mr. Edison was employed as an operator from 1863 until 1869, a period of about six years. According to report, he developed into a first-class operator very soon after learning the business.

A specimen of his penmanship is reproduced herewith. It is not a typical telegraph hand, and very likely was written with a minimum of wrist and



THE WESTERN UNION TELEGRAPH COMPANY.

No. _____ The rules of this Company require that all messages received for transmission shall be written on the message blanks of the Company, under and subject to the conditions printed thereon, which conditions have been agreed to by the sender of the following message.

C. H. MUMFORD, Sec. T. T. ECKERT, Gen. Supt., New York. WILLIAM ORTON, Pres't.

$4 5

Dated. Rec'd at 145 Broadway,

To Mr W. O. Phillips April 1874

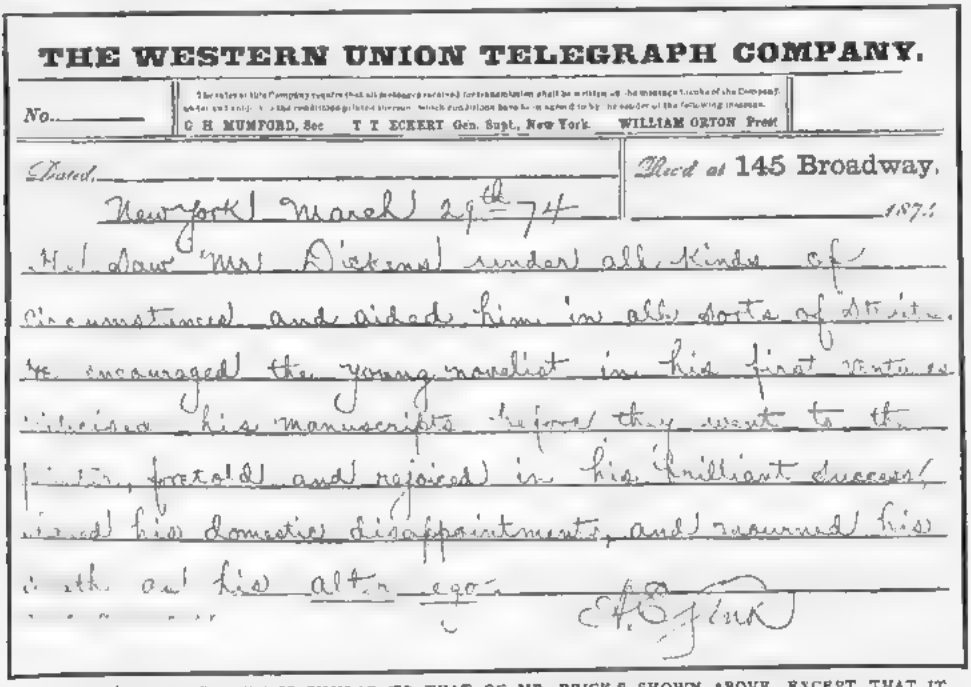
His life was neither rich nor poetic nor heroic nor grand. He had wonderful powers of observation and imagination. He was marvellously powerful in fertile fancy an inexhaustless fund of humor.

C. Morris Brick

MORRIS BRICK WAS ONE OF THE STARS OF FORTY YEARS AGO. WRITING IN THIS HAND, HE COULD COPY FIFTEEN OR TWENTY WORDS WITH ONE GOOD DIP OF INK.

elbow movement, excepting when making flourishes at the beginning of a word.

It is a singular fact that only rarely has an operator in practise attempted to



THE WESTERN UNION TELEGRAPH COMPANY.

No. _____ The rules of this Company require that all messages received for transmission shall be written on the message blanks of the Company, under and subject to the conditions printed thereon, which conditions have been agreed to by the sender of the following message.

C. H. MUMFORD, Sec. T. T. ECKERT Gen. Supt., New York. WILLIAM ORTON Pres't

Dated. Rec'd at 145 Broadway,

New York March 29th 74 _____ 187-

H. L. Dana "Mrs Dickens" under all kinds of circumstances and aided him in all sorts of diverse. He encouraged the young novelist in his first venture criticised his manuscripts before they went to the printer, feasted and rejoiced in his brilliant success, wept his domestic disappointments, and mourned his death and his alter ego.

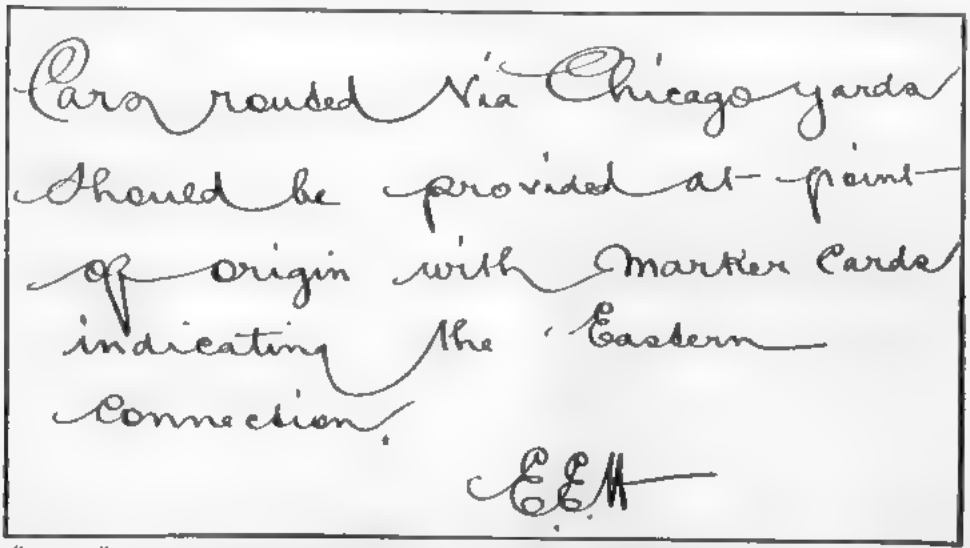
C. H. Sink

MR. SINK'S CHIROGRAPHY IS SIMILAR TO THAT OF MR. BRICK'S SHOWN ABOVE, EXCEPT THAT IT HAS LESS RANGE OF VERTICAL MOTION. MR. SINK WAS AT ONE TIME MANAGER OF THE WESTERN UNION'S NEW YORK MAIN OFFICE.

copy Mr. Edison's style of penmanship. It is a beautiful and a legible hand, but there are not many who could learn to write it at a fast enough clip.

Can Copy 15 Words with One Dip.

A typical fast telegraph hand is that reproduced herewith, written by Morris Brick, one of the stars of forty years ago.



"E. E. H." IS CHIEF OPERATOR HEASLEY, OF THE POSTAL'S PITTSBURGH MAIN OFFICE "WE HAVE HERE," SAYS MR. MCNICOL, "AN EXAMPLE OF THE GENERIC TELEGRAPH HAND IN ITS HIGHEST DEVELOPMENT"

Here we have an example of free elbow movement and of very slight pressure of the pen upon the paper. With this hand a healthy dip of ink should suffice in copying fifteen or twenty words.

A similar style of writing, but one with less range of vertical motion, is that shown in the specimen written (forty-odd years ago) by A. E. Sink, one-time manager of the Western Union's New York main office. It may be observed that in building the words, each letter of the word retains its individuality and is perfectly formed.

The reproduction of Mr. George M. Eitemiller's penmanship is that of one of the most expert telegraphers of the days prior, and also subsequent, to the advent of the typewriter. Mr. Eitemiller, in his prime, could write with a pen hour after hour at the rate of fifty-five words per minute. At sixty-seven years of age he could still copy fifty-five telegrams per hour with a pen.

The specimen signed "E. E. H." is that of Chief Operator Heasley, of the Postal's Pittsburgh main office. We have here an example of the generic telegraph hand in its highest development.

In a sense, this is a composite of all good telegraph hands, and it may safely be stated that a greater number of first-class operators turn out "copy" similar to this specimen, in style, than of any of the other variations recognized as typically telegraphic. The knack of producing at high speed the extra curve shown between the words "with" and "marker" has, in perfecting it, cost the railroad companies and telegraph companies many a dollar for pens, paper, and ink.

The specimen signed by H. T. Marks and the specimen which in its text makes reference to "an iron sign" were written recently by operators who learned to telegraph after the typewriter was introduced in copying messages, and are typical of the penmanship still widely seen

in both railroad and commercial-telegraph offices all over the country.

Radio Men Scrawl.

The ability to write a plain, rapid hand is still highly regarded in telegraph circles. A unique situation has recently developed in connection with the operation of wireless-telegraph systems. The greater number of the men now working as radio operators learned the business while dabbling in amateur wireless. Very few of them have devoted much time to learning how to write well.

The wretched penmanship of radio operators has been widely commented upon, and is a subject of grave concern to the employing companies. The noise made by a typewriter in operation precludes its use in wireless work, except in those rare instances when received signals are very loud.

BRASS-POUNDER IN CONGRESS.

HON GEORGE E. HOOD

STARTING IN LIFE AS A TELEGRAPH MESSENGER BOY, HE WAS ELECTED TO THE HOUSE OF REPRESENTATIVES AT 40

From a photograph copyrighted by Harris & Ewing, Washington, D. C.

GEORGE E. HOOD, who is the Representative in Congress for the Third District of North Carolina, left the old farm when he was fifteen years old and became a telegraph messenger boy. Two years later, when he had learned Morse, he was made bookkeeper for the Western Union at Goldsboro, his home town in the old North State.

In 1893, when he was only eighteen, he became assistant manager of the office, and the following year he went to the Southern Railway as telegraph operator and billing-clerk.

He studied law at night while on this job, and was able to pass his bar examination before the Supreme Court of North Carolina in 1906. On the death of his father, who was treasurer of Wayne County, he was elected to fill the treasurership.

In 1901 Wayne County chose him as its representative in the State Legislature, but a year later he was elected mayor of Goldsboro, and held that office for six years. He was elected to Congress in 1915, and is a member of the House committees on Census, Immigration, and Naturalization, and Public Buildings and Grounds. Hood has also been prominent in national guard affairs. He served as captain from 1898 to 1905, was then promoted to lieutenant-colonel, and became assistant general of ordnance. He was retired in 1909 with the rank of colonel.

HONK AND HORACE.

BY EMMET F. HARTE.

How Nice of the Road to Let Its Help, Including Our Two Old Friends, Garden on the Right-of-Way!

AN INEXORABLE SHADOW FOLLOWED SPOOKLIKE IN HIS WAKE.

THE chronological period covered by this pleasantly diverting tale extends from early spring, tra la, to the middle of midsummer, but I'll try not to keep you that long while I'm recounting it.

The plot concerns quite a number of folks in and around the bustling burg of Valhalla, this State, and more especially me myself together with my whilom *fidus Achates* and coadjutor in the service of the Transcontinental Railroad, Hancock Simpson, otherwise nicknamed Honk—*fidus Achates* being foreign gibberish meaning a guy who lets you do him favors while pretending to be your friend.

However, to dive headlong into the matter:

I'm not of a suspicious nature unless something comes up to make me distrustful. And something Honk did awakened an emotion of this sort in my unsuspecting bosom. For four or five consecutive evenings he absented himself, at the same time confiding in me no hint of where he'd been or what he was doing during said mysterious intervals.

I thought to myself, thought I, there was a furtive not to say duplicitous look about his eyes, such as one sees in the facial expression of a sheep-killing dog, as it were.

But I didn't let him suspect that I suspected him. No. You surely know my methods better than that, *Watson*. I put on my rubber-soled shoes, assumed my blankest look of inscrutable unconcern, and prepared to give him the benefit of a little expert espionage. So far so good.

That evening again, after supper, he ducked out slyly as usual.

This time an inexorable Shadow followed spooklike in his wake. It was I, unseen, unheard, and undreamed-of, but grim in the determination to prosecute a painful duty to the end, let the consequences engulf friend or foe willy-nilly, and hip-hip-hooray! What followed was substantially as follows:

The fugitive—as an actual fact, Honk wasn't really a fugitive exactly, but I always like to refer to whoever I'm shadowing as a fugitive—went first to the depot freight-room, where he donned overalls (with bib attachment), heavy-soled, clod-hopping shoes, and slouch-hat. He then secured a digging-fork from a covert nook where it had lain concealed, and set out guardedly along the track in a westerly direction.

Ten minutes later, as I lay snugly secreted in a clump of tall, dead weeds, I saw him take his place in the ranks of a numerous company of people, women and children mostly, who were actively employed in spading, hoeing, forking, and otherwise delving and uprooting the soil of what for our purposes we may term the railroad right-of-way.

Watching careless—that is, carefully—I presently made out that the whole outfit seemed to be planting seeds, roots, bulbs, or something similar in the ground, the varlet I shadowed hither among the rest. (I call Honk a varlet merely to give the effect of deceit and sculduggery to his actions, don't you know.)

Meanwhile from my vantage-point I sized up those present. I knew many of them by name. They were the wives and progeny of switchmen, machinists, car-tinks, wipers, and even brakemen, engineers, and others whose callings called them out on the road.

Then all of a sudden I realized what they were doing. They were planting vegetables, making gardens with the object of propagating garden "sass," in fact.

My man being within a few feet of me at this time, I rose up out of my clump of weeds and proceeded to address him, speaking his name. It gave him something of a shock, too, when I did this, as of course he wasn't expecting me.

"So-ho!" said I. "You're farming, are you?"

Honk—for the person addressed was indeed Honk, of course—narrowly missed

EIGHT OF MY PRETTY AND INNOCENT TOMATO-PLANTS HAD BEEN SHORN OFF SHEER AT THE TOP OF THE GROUND.

impaling his near foot with his digging-fork.

"Jeepers, Horace!" he ejaculated. "You almost startled me, popping up like a jack-in-the-box that way! How long have you been hiding in those weeds, and whaddye mean by it?"

"Wuff!" I returned gruffly. "That's neither here nor there. The question is, what do you yourself mean by this—this sudden reversion to barbarism? Is it a momentary whim, or a regular mania, or what? And why wasn't I told of it? What's the terrific reason for secrecy, hey? Explain fast before I lose patience with you."

"Hoity-toity, Horace," Honk mumbled shamefacedly for all of his trying to appear at his ease. "You knew about the company's proposition this spring to—ah—throw open all vacant ground, right-of-way, and such like, to anybody that desired to do a little intensive gardening—did you not? It's great, you know!" he continued with hysterical haste. "Ripping, really! Fine exercise, and—and—"

As a matter of fact, I *had* heard something about the company's project to permit the ebullient "nesters" and small homesteaders along its route to preempt miniature agricultural claims on the railroad property, but I'd forgotten all about it. Now that I recalled it, I remembered that they'd even offered a list of prizes, to be paid in actual cash money, to those who went into the thing and stuck to it till the harvest days were over, Birdie dear.

Prizes like fifty cents for the biggest radish, one dollar for the beatin'est ear of corn or pumpkin, two dollars for the best something else or other, and finally a grand premier award of ten dollars in yellow gold for the star garden of them all.

Yes, I recalled the whole scheme in detail. The company seemed really anxious for folks to enter the contest.

Anybody with a taste for toiling in the broiling sun, a hoe, rake, spade, or even a stout butcher-knife, a strong back, and a disregard for blisters, both foot and hand, was heartily welcome to compete till they petered out.

If a competer was pecuniarily pinched and couldn't spare the price, and could prove it, the company would go so far as to stake him to seeds for planting.

And they offered special inducements for flowers: pansies, primroses, johnny-jump-ups, sunflowers, cauliflowers—but then I suppose they figured it would add to the artistic outlook for tourists. Um—h-m! I affected to ruminate.

"Don't prate to me of exercise," I said sternly. "You're not in this game for your health. There's something back of it when a philosopher like you voluntarily hitches himself up to a hoe. How comes it that I find you besmirching the chaste toga of Socrates with mud-stains from the sodden fields of Cincinnatus?"

Honk gazed at me dazedly. I guess another one like that would 've just about knocked the track out from under his tractor. Sometimes I am a little fearsome that one of my apt classical allusions will bounce off the armored turret of his comprehension with disastrous results to an innocent bystander, as his working knowledge of highbrow, literary lore does get lost in the shuffle mightily at times.

With me it's different. I've recently been polishing up on all that bygone dope, hence I'm a holy terror with it. For instance, I know that this Socrates party was a famous corner-grocery politician of Rome—or maybe 'twas Egypt—and was especially noted for stuttering. No, I'm wrong there. The gink that stuttered was named Demagogue.

Well, anyhow, the other fellow I mentioned, Cincinnatus, was the first suburban farmer recorded in history (afterward being chosen as the patron saint of Cincinnati, Ohio, you know), and had an alfalfa-patch across the River Tigris from the old Cæsar place which was spread over seven different hills.

According to reports, when a gang of tough guys from down-river was rumored

to be getting ready to raid the village, Cincy was elected city marshal without even having announced himself as candidate for the office, and a hasty messenger-boy was sent post-haste on foot to apprise him of his good fortune. He was found busy hoeing spinach, and at first refused the office three times by saying "No, no, no," rapidly; but he afterward gave in when informed that he stood in danger of getting fined the whole of his summer's wages for contempt of the mayor, or something.

'Tis said that when he finally made up his mind to accept, he did it so quick he didn't even stop to unhook the little red bullock from its plow, but grabbed his snickersnee, bow, arrows, and beat it for the front—which goes to prove my theory that a man, take him all down through the heroic and sanguinary pages of history, would rather fight than work any time, when he has a chance to choose between the two.

Meanwhile Honk had recovered the use of his tongue:

"Fiddle-de-dee, Horace! What 're you talking about? I take it from the sneery look in the tones of your voice that you imagine you've caught me in some kind of a compromising position. Is that right?"

"A guilty conscience needs no search-warrant," I quoted haughtily.

That seemed to animate his animosity like a lighted cigar-stub carelessly tossed into a box of fireworks.

"Oh, very well!" he snorted sarcastically. "Think or say what you please. I reckon I've got a right to make a garden if I feel like it, and I don't have to ask your permission either. Everybody knows you're a regular cold-water douche on any proposition that comes up.

"You're the original dissenter; backing and filling is your cherished prerogative; you wouldn't take a chance on anything yourself, and you'd like to queer whatever any one else undertakes if possible. Don't stand there goggling at me, you big slob—" His voice gradually rose until those nearest stopped their tilling to rubber.

"Avast!" I interrupted. "Quiet down a bit before you say something personal that I'll afterward be sorry I swatted you for saying. I don't object to honest criticism, but I do draw the line on unsolicitated abuse.

"You're mistaken if you think I look down on this gardening venture of yours. Far from it. I regard gardening as one of the finest pastimes I know of. Tilling the fecund earth for its own sake is both romantic and poetic. I love it. Our first parents were gardeners, and the back-to-nature yearning liest latent or active in the hearts of all who claim kindred with the original Adams family.

"I only deplore the fact that you have ignored me, and saw fit to slip off like a thief in the night without asking me to participate in the venture. I am deeply wounded and hurt at your deliberately snubbing meh—" And, brushing away an imaginary tear, I turned to homeward plod my weary way and leave the world to darkness and the moping, moonstruck owl, as the poet so feelingly says.

"Well, I'm a son of a sea-cook!" I heard Honk mutter moodily to himself.

He wasn't overtalkative next day. Several times I caught him watching me breathlessly out of the corner of his eye as if uncertain whether to engage me in friendly converse or shriek for the constabulary. At supper he unbent a little.

"Horace, old hoss," he began wheedlingly, "there's a plot of ground adjoining my garden on the west that you might take on if you think you'd like—"

"Don't disturb yourself, sport," I retorted. "I've already been out and filed on the claim you refer to. And I've also purchased the necessary tools, implements, machinery, seeds, roots, cuttings, and agricultural apparel for the work. If you cast your eyes over that way this evening I've an idea you'll see me engaged in the preliminary task of sowing and

HIS GARDEN THROVE LIKE A JIMPSON-TREE IN A HOTBED

planting a garden which 'll be a real garden, my friend. I don't mind saying that I intend to cop every prize the company has offered."

Honk tried to conceal a faint titter of unbelief.

"Oh, yes!" he said. "Not a bit of doubt about it."

We walked out the track together that evening. Honk essayed to overawe me by harping on "supercultivation," "fertilization," "crop rotation," and so on. One of his pet obsessions is the notion that he's an authority on intensive husbandry.

I dismissed his dull diatribes with the flip of a flipper.

"The first fifteen years of my life were spent hoeing in a vegetable-garden," I informed him coldly. "I know the business from asparagus to yams."

Which served neatly to cut short his clack.

There isn't anything so ferociously intricate or complex in raising garden-truck either. Dirt is dirt, and digging is digging, and where a succulent cabbage-head or cucumber will sprout there will countless hosts and varieties of weeds rear their heads jauntily and flourish likewise. All it takes is elbow-grease and sufficient gumption to discriminate between "pussley" and parsnips when both are young. It's easy to make one's self unnecessary work by mistaking incipient plants for incipient weeds.

I took formal possession of my tract in the name of Cerebus, the god of the harvest, and began to plan my summer's work. It's really remarkable what an array of things you can grow out of the ground; not only vegetables, but fruits and flowers.

Take, for example, corn in its various phases and guises: There's red, white, blue, yellow, and speckled field-corn, which is also called Indian corn or maize; then there's sweet, pop, and Kafir corn, and—

Take beans, too. Gracious! Chile beans, lima beans, navy beans, soy beans, and string, pole, wax, bunch, kidney, castor, black, green — even jumping beans. Gee!

I decided not to go into the game too extensively the first season. Later on I might branch out, but this year I'd aim to bite off only what I could Fletcherize nicely and swallow without surgical assistance. My plan included spuds,

tomatoes, cabbages, and onions—and one cheery, brightly colored geranium-flower for a touch of local color.

Honk was more ambitious. He meant to out-burbank Burbank, to hear him tell it. He'd already compiled a list of fifty-seven varieties of the commoner vegetables to start out with, with his main crop of edible herbage, fruits, flowers, *et cetry*, to come along later.

It was right diverting to hear him expand and tell what he really seemed to believe he was going to accomplish. Downright diverting.

I find here that I can borrow an idea from the moving-picture manufacturers very handily—while they aren't looking. Just assume that I've flashed on the screen the following time-honored neat motto:

NEARLY A MONTH HAS ELAPSED

Please note in addition this picture: A far-flung sequence of weed-bordered, cultivated spaces, kissed by the slant rays of the setting sun. Mark the forms of several sunbonneted women and freckled urchins dotted round about. These are the wives and progeny of those garden-loving employees of the Transcontinental, men who were stanchly in favor of the company's idea, and enthusiastically directed their folk how, where, and when to plant the seeds which later were to develop into prize-winning beets, peas, and turnips.

Besides, it provided pleasant recreation for those who had nothing to do but housework, mending, and looking after anywhere from two to ten kids; not only pleasant, but profitable.

"Stuff out of one's own garden tastes different, you know—"

Be sure to note the swish and flash of hoes, rakes, and similar instruments—the buzzing of insects mingled with the hum of human speech. Then we have a close-up view of two full-grown men in the hardihood of robustious manliness—one tall, the other short and quite plump in spots.

Note also, vegetables and other flora; likewise fauna—scadoodles of fauna. Gnats, flies, mosquitoes, beetles, bugs, moths, insects, ants, butterflies, worms, grubs, larvae, caterpillars, midges, grasshoppers, snake-feeders, spiders, wasps, bees (honey, bumble, and sweat), hornets, yellow-jackets, mud-daubers. And birds—sparrows, jaybirds, robins, larks, bluebirds, blackbirds, redbirds, thrushes, orioles, wrens, catbirds, crows, hawks, owls, woodpeckers.

Got all that? All right.

Everything progressed smoothly at first. Sometimes it was a toss-up to distinguish between the pleasant pastime we were all engaged in and actual, dog-tiring, back-breaking work; but no matter. Then something happened that I thought rather strange.

I had paid down two-bits cash for a dozen tomato-plants which I'd sat, or set, out in carefully cleared spaces momentarily reclaimed from the upstarting weeds. I remember how, when I'd finished setting, or sitting, out those plants I stood as the mellow moon rose, and took a last, fondly admiring look at my twelve drooping and slightly homesick tomatoes, each in his own little clearing, a stranger in a strange land.

All twelve bore up bravely for a day or two, though, and seemed as if they might ultimately learn to like the place. And then, early one bright morning, what did I find?

Aye, what did I? Truly it was a heart-rending sight that greeted me. Eight—I counted 'em—eight of my pretty and innocent tomato-plants had been shorn off sheer at the top of the ground—cut down, amputated by the foul blade of some scurrilous vandal!

Diablo! For several seconds I saw red. And then I began to circle about, nosing the earth like a pointer in the hope of finding some hoofprints of the devastator of my demesne.

I found not even a bird track— Hold!

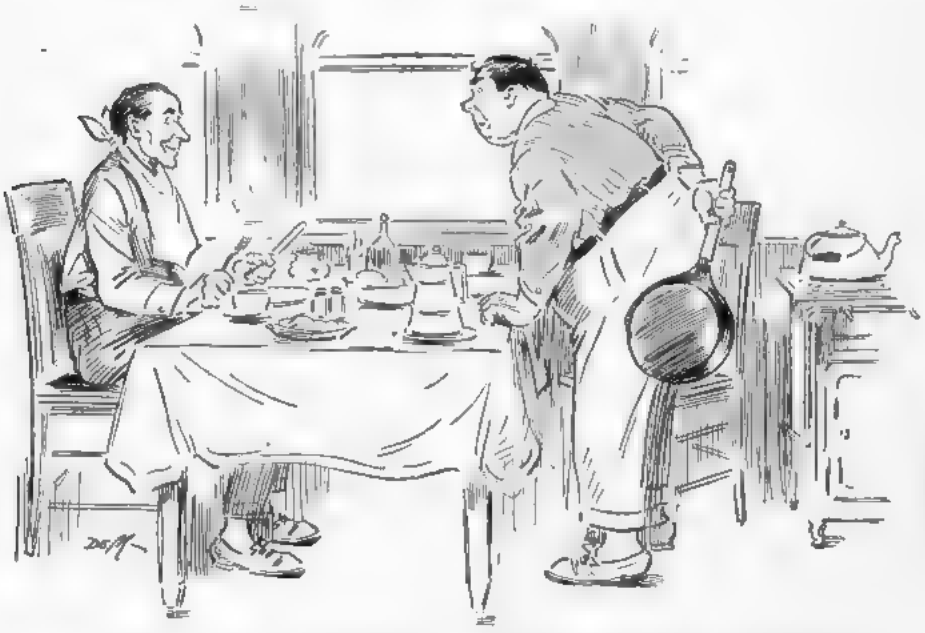
I did find the print of a large, man's-size shoe, but upon measuring, calculating, and fitting my own foot to it, I perforce decided that it was a track I'd made myself, unthoughtedly.

The question was, who had done this deed? I— At that moment I saw Honk coming, whistling as if trying to appear unconcerned, along the railroad track. Could it be possible that he— Zounds,

He stooped and with a couple of jabs with his knife uprooted a small, blackish-brown grub-worm, and held it up for my inspection.

"Here he is!" he called out. "See? They're sure a pestilence to tomato-plants."

"Do you have the nerve to tell me that an insignificant worm did that?" I roared. "Bah! Bunk! I don't believe



FOR THE SAKE OF HIS AGED MOTHER AND SISTER IN ST PAUL I SUFFERED HIS WORDS TO GO UNCHASTISED

no! He wouldn't stoop to such villainy, neither would he dare— The idea!

Nevertheless I called him over and indicated my prostrate plants, at the same time watching him narrowly to catch the smallest hint of guilt in his word or look.

"Um," he said. "Cut-worms, eh? Too bad, Horace!"

"Cut-worms is right," I said bitterly. "I'd dearly love to have caught 'em at it, too. I'll bet there'd 've been a sound of revelry by night in this vicinity."

"You wanta dig right down in the hill where he's been operating," Honk said, "and nine times out of ten you'll find the rascal."

you. It was the treacherous blade of a skulking assassin that did it. A knife gripped in the hand of a jealous heart— a heart reeking with malice and envy!"

But Honk argued otherwise, and to prove his contentions proceeded to dig a black worm out of each one of my tomato-hills. Nevertheless, I refused to be convinced by any such puerile proofs as that.

I'd like to describe in detail my experiences with cabbage, potatoes, onions, and sweet corn, only this is merely a skit, not a serial story. My cabbage-plants grew prolifically for several days. Then one morning I found merely a stub in the

place of each. Inwardly raging, I brought Honk over to see what had happened.

"Rabbits," he said.

My spuds put forth towering, green tops—which later gradually melted away into thin air and disappeared.

"Bugs," quoth Honk.

But lemme tell you about my onions and sweet corn.

A day came when I discovered whole rows of my dainty spring onions and delicious, newly sprouted sweet corn wrenched up bodily and left lying on the ground, deader than so many proverbial mackerels. To make sure that I wouldn't reset the plants, whoever had done this dastardly deed had gone to the trouble of removing the bulbous root from each onion and the seed grain from each stalk of corn. Maledictions!

A joke is a joke, and no one likes a good joke better than I; but malicious mischief is another matter. A nice how-d'ye-do it was when a taxpayer and patriotic citizen couldn't be protected from the ravages of night-scurrying sneaks and scoundrels!

I whistled hoarsely for Honk.

"Maybe you'll have the effrontery to say 'cut-worms,' 'rabbits,' or 'bugs' to this!" I sneered. "Maybe you'll try to make me believe a horse-fly or a June-bug yanked up these plants by the roots, and then hid the roots so I couldn't replant 'em again—"

"Blackbirds," announced Honk.

This disaster set me back so far that my principal crops never could hope to catch up with the weeds, no matter how earnestly I sympathized with the poor things and encouraged them with my moral support in their losing fight. When it got so I couldn't see my crops for the tall weeds I began to lose faith in nature's vaunted wisdom and foresight. Either that, or the cards were stacked against me.

The fates seemed to favor Honk, though; his garden throve like a jimpson-tree in a hotbed, and neither bird, bug, nor beastie so much as smelled of his stuff apparently. In my despair I besought him plaintively to explain it—if he dared. When 'twas too late for me to profit by the information he did so.

"Fertilization," he growled. "Blood and bonemeal makes things grow. As for insect pests, you spray for them—Paris green, lime and sulfur, and so on."

"And the birds," I whispered. "Do you spray for the birds, too?"

"Nup. You put bits of broken mirror about; they're scared of the glitter, see?"

Think of trying to bamboozle a grown man in the full possession of his eyes and ears with a fanciful mess of guff like that! Think of it! However, I lacked actual evidence to substantiate what I secretly believed.

Although convinced in my own mind that an unscrupulous and—shall I say human?—agency had been at work in my garden, I'd never succeeded in catching the villain at his nefarious sculduggery; and until I did catch the caitiff I must needs dissemble. So I pretended to swallow Honk's bunk without a quibble, and with this idea in mind affected to find a queer taste about the vegetables we ate—grown in Honk's wonderful garden.

"This lettuce, now," I observed, "has an odd flavor. Is it Paris green? I suppose it's quite safe to eat it—"

"Bosh!" snarled Honk. "No one puts Paris green on lettuce. The idea! Horace, your head would delight a manufacturer of billiard-balls. What you don't know about gardening would fill a shelf of books extending from Skibo Castle to Six-Best-Sellersville, Indiana. Your notions of vegetable-growing would make a horse laugh."

I remained calm.

"What looks peculiar to me," I continued, "is the fact that *my* garden suffered all sorts of mishaps while others right adjoining it escaped without a scratch. It puzzles me. I can't account for it, according to any known natural law in the spiritual world."

HAPPY JACK WORE, PINNED TO THE BREAST OF HIS COAT, A RED, RED GERANIUM-PLANT

"Don't try to account for it, then," he said. "Forget it. What does it amount to, anyway?"

I lost control of myself for a moment at that open-faced dab.

"What does it amount to?" I roared out suddenly in righteous rage. "It amounts to a good deal—to *me!* Why shouldn't I be permitted to grow a garden unmolested same as other people? Why should my patch be singled out for destruction among a dozen like it, only not half as good? I can tell you why! It's because somebody has a green-eyed monster gnawing at their vitals!"

"That's right! Blame it on somebody else, if possible! Why, you big boob, I tried to advise you what to do, but you wouldn't listen. You knew it all, you said. And now, since you've got what anybody could 've told you you would get, you sit back and yammer and beef and carp and crash. You make me tired."

I didn't hit him—astonishing though it may seem. No, for the sake of his aged mother and sister in St. Paul I suffered his words to go unchastised.

Later on he got what he got—and while I had no avowed hand in it, he'd forfeited his claims on me for sympathy. Let us hustle along now. It's only a couple of steps to the place where all hands get off.

As I said, I had lost confidence. I went out once or twice more, suffused with rekindled hope, but 'twas no use. I only got my hoe tangled in the grass to no end save to lacerate my sad heart. Honk's truck-patch continued to flourish and bloom out like the far-famed green-bay bush, but nothing was left of mine but a solitary red geranium-flower entirely surrounded by a seething sea of riotous, ribald weeds.

Then came the explosion. We were at our usual tasks in the station one day about quitting time when Honk removed his gaze from the clock and let it stray out the window.

"Oh! haw! haw!" he blared out abruptly like a he-mule braying.

"What now?" I commented. "Practising up on a veterinary-college yell, or learning to call hogs?"

"Why—why, here comes Happy Jack Dobbs on one of his periodicals, Horace.

And if I'm not mistaken, he's wearing that geranium you've been nurturing so tenderly among the weeds of your garden this summer."

Of course the reference to the weeds was a vile dab, but I passed it over at the moment.

"Wha-at!" I shouted, leaping to the window.

And, 'od's fish! It looked as if he were right. Happy Jack wore, pinned to the breast of his coat, a red, red geranium-plant complete (not a cutting), gaudy with several blossoms, and with a good quart of dirt yet clinging to its roots. Like a conquering hero he rolled past—save for a slight list to port as he tacked to windward on his course.

I made for the door with the idea of ascertaining positively that it was my prize flower which had been ravished before I started anything. A few minutes later I stood in my garden, Maud, and, heigh-ho! It was too true. Only a gaping wound in the ground was all that remained of my pretty posy. The last tie that bound me to the simple life was sundered.

I glowered around glumly, and thus staring, I saw something that almost induced a hysteria of mixed emotions. Something had happened to Honk's garden. Something fierce! A convulsion of nature seemingly, a cataclysmic upheaval, nothing less. Breathless, awe-stricken, I stole nearer—holding my sides in my excess of—of deep feeling.

Honk's garden was but a pleasant memory—a chaotic shambles of uprooted débris, pitted here and there by shell craters, and trampled and crisscrossed with hoof-prints. 'Twas at this supreme moment that Honk himself hove in sight; he'd tarried to don overalls and hoe before following me.

Alas! He no longer needed his hoe. His work was finished.

He stared at the riot and ruin dumbly, and then almost fearfully at me. I read his look. He thought that I—I, his former friend and comrade—had gone berserk and done this thing.

A low, meaningless, babbling sound began to ooze from his pallid lips. I shrugged a shoulder gracefully.

"Cow," I said briefly. "Pigs, too. Too bad."

I'll skip over what Honk said. It wouldn't get any of us anywhere to repeat it.

It was maybe five minutes later when I stubbed my toe on something in the tangled coppice of pampas grass on my own plantation. I kicked my foot free, discovering as I did so something large, white, and globular-shaped which lay half-buried in the ground.

It was a Bermuda onion, and a whopper. Gee! I hesitate to give its weight and measurements for fear of being hastily called a—well, a nature-faker if nothing more.

Let it suffice to say that I won first money in the sweepstakes for all classes of onions. A grand cash award of a shining silver dollar. Honk—poor unfortunate, I felt sorry for him in my secret heart though I carefully kept it concealed from him—Honk copped out what the little boy shot at. In conclusion I shall quote a quotation from an ancient tongue—Latin, I think, or perhaps Doric or Ionic:

E pluribus Onion!

Which means in English, "Many are called, but few are chosen."

THE AUDITOR OF MISCELLANEOUS ACCOUNTS SAYS:

YOU'LL GET RICH ON WHAT YOU SAVE, NOT ON WHAT YOU EARN

FROM THE RAILROAD MAN'S MAGAZINE.

OLD TIMES ON G., H. AND S. A.

The Galveston, Harrisburg and San Antonio as It Was in the Days before It Became Part of the S. P.

OPS WENT "NUTS" FROM LONELINESS.

How the Song of a "Texas Mocking Bird" Prevented a Wreck.—The Famous Railroad Hostelry-Museum, "X—10—U—8," Where "Bill" Pratt and "Jim" Molloy Wouldn't Sell Any One More Than Six Drinks a Day.

BY "J. E. M.,"

Author of "Old Times on the Erie," "Old Times on the 'Gould Southwestern,'" "Old Times on the West Shore," "Old Times with Morse Men," etc.

HE Galveston, Harrisburg and San Antonio Railroad — that portion of the Southern Pacific system which stretches clear across the great State of Texas from Houston on the southeast, to El Paso on the northwest—is a great division of a great railroad system to-day; but even twenty-eight or thirty years ago it was *some* road, and we had *some* railroaders employed on it, believe me.

Tempting Jobs for Boomers.

This portion of the Southern Pacific system was, I believe, one of the first railroads if not the very first railroad in the country to adopt the air-brake on its freight equipment, and to fit completely all of its freight rolling-stock with straight air-brakes, and do away with the manual or hand-brakes. The rest of the roads, particularly those in the West and Southwest, tailed along some time later.

Due to adopting the invention, jobs "braking" on this road were much sought after by the large family of "boomer" brakemen who had gained their railroad education by the time-honored method of waltzing over the top and twisting the brake-wheels by hand or with the aid of a heavy, strong, hickory brake-club at the signal of one sharp blast of the whistle, and releasing them again when two blasts were sounded. This was, of course, good exercise, and tended to harden and develop the muscles as well as the tempers and profane eloquence of the "brakies."

It was also a rather dangerous operation, and one which required steady nerves and active footwork, of which the present-day brakeman knows nothing—a circumstance for which he should be duly and piously thankful.

The freight-crews on the G., H. and S. A. at this time consisted of four men besides the conductor, namely: the head man, who rode on or near the engine;

the middle man, whose post was about the middle of the train; the hind man, who was stationed near the caboose; and the flagman, who rode in the caboose and was prepared at all times to run back with his flags or lanterns if any mishap should befall his train, or if it should be stopped anywhere on the main track.

It was necessary that either the rear brakeman or the flagman, preferably the former, should be a telegraph operator. Each caboose carried a combination set of telegraph instruments, compactly enclosed in a carrying-case, and the train-despatcher's wire, at regular intervals of from five to six miles apart, was run down a pole and into a box attached to the pole, somewhat similar to the manner in which the telephone is arranged to-day on some railroads.

Trains Got Orders Direct from Despatcher.

The telegraph-offices were located some distance apart, more especially during the night time; so, in the event of a train not making its expected time, or in case any mishap befell it, the operator-brakeman, or operator-flagman would take his "set," cut in on the pole, call the train-despatcher, and get the orders for the future movements of his train. Precisely the same system prevails to-day, only the telephone is utilized instead of the telegraph on many railroads.

I am not sure that on the Eastern district, between Houston and San Antonio, the crews included an operator; I am inclined to think not. But on the Western district, between San Antonio and El Paso, every train, passenger as well as freight, carried a telegrapher as a part of its regular crew. These were considered choice jobs, and were much in request by the younger element who liked to be constantly on the move.

At the time of which I write, R. H. Innis was division superintendent at El Paso, his division extending from San Antonio to El Paso. Mr. Innis was transferred in a short time to a similar position at San Antonio. J. W. Martin was the chief train-despatcher. George Stewart, who succeeded Mr. Martin when the latter was made superintendent following Mr. Innis's transfer, worked the first trick.

"Joe" Heisler, now chief despatcher for the Gulf and Ship Island, at Hattiesburg, Mississippi, worked second, and "Jimmie" Ellsworth, who was chief despatcher for the Mexican National Lines at Chihuahua when the Madero revolution broke out in that country, and was one of the first to lose his life during the first siege of Chihuahua, worked the third trick. Jimmie was the famous "Je," known far and wide as a friend of the boomer

John R. Miller was one of the copying operators, working the day trick, while "Bob" McDowell worked the night shift. Mr. Miller was afterward trainmaster. Later he quit railroading and not long ago was the assistant general manager of a large railroad-supply house, while "Bob" went to Mexico and has never been heard of since.

Ops Found the Loneliness "Fierce."

The communities between San Antonio and El Paso were few and far between, and what towns and cities there were along this division would hardly gain recognition as such in the North. This was essentially a cattle-raising country and the population was extremely thin-spread over it. Consequently many of the operators and agents on this division were compelled to "bach," usually two or three rooms being built at the rear of the station for their accommodation, where there was a station.

Many telegraph offices, however, were merely box-cars set off and fitted up in a crude manner for the transaction of the necessary telegraph work, a part at one end being partitioned off for living-quarters, where the operators cooked and ate and slept. At many places there was but one operator, usually a night man, and I want to tell you that the lives that these fellows led was some lonesome. It was

bad enough, in all conscience, where there were two men employed, but where one man was alone—well, it was simply fierce.

There was an arrangement somewhat similar to the telephone selector of today, which was operated from the despatcher's office; should one of these "one-man" offices be required after hours, the despatcher manipulated a key which formed part of the mechanism, with the result that a bell was made to ring in the distant office, and rang until the operator answered his call. For these after-hours summonses the telegrapher received extra compensation at the rate of 50 cents per call. Some of these "desert rats," or "prairie dogs," as they were named, frequently made as much as $125 or $130 a month from their regular salary and the additional sum earned by extra calls.

But even this good money scarcely made up for the lonesome life one was compelled to lead. A box-car set in the middle of a vast flat prairie, with nothing in sight but the never changing semi-desert scenery; absolutely no company; no one to talk to day after day, except when some train came to a stop and the crew came to the office for orders—that was the life led by the desert rat.

The terrible, awesome silence and unending solitude has caused more than one telegrapher located at these "one-man" offices on the desert and prairie, to lose his reason temporarily.

The Case of Ora Eaton.

I have in mind one case which came under my personal observation, I being employed but a few miles away. This case, however, did not occur at a one-man station, but was the result of a little disagreement between the two telegraphers on the job.

The place was Marathon, Texas. It is now a thriving little community, I understand, but at that time there was nothing there except the depot, to which had been built an addition of two rooms in the rear for the accommodation of the agent and operators.

There was a military post twenty-five or thirty miles away to the west, on the banks of the Rio Grande, and a number of mammoth cattle ranches were scattered to the east, north and south, within a distance of fifty miles. These were the reasons for the station and the station-agent.

The agent at that time was Harry Burnett, who a couple or three years later went to Guatemala as trainmaster of the Guatemala government railroad, afterward becoming general manager of the same line. The night operator was Ora Eaton, who became one of the star operators of the Associated Press in later years, and who died some seven or eight years ago in New Orleans, Louisiana, where he was employed by a prominent cotton-brokerage firm.

Day Man Had Company; Eaton None.

Burnett, as agent, worked from 7 o'clock in the morning until 7 in the evening, while Eaton worked from 7 P.M. until 7 A.M. Burnett, besides being the railroad agent, was the Wells Fargo express agent, as well as postmaster. A wagon was driven over from the military post daily after the mail; it was usually accompanied by three or four soldiers, with sometimes an officer. Besides these, there were always ranchmen and cowboys coming and going every day, and all day long, after their freight, express and mail, so that Burnett did not lack for company.

At night, however, it was different. After Eaton came on duty there was not a soul to be seen or talked to unless it was the crew of some freight train for which there were orders. In this event, the conductor merely said "Hello," signed his orders and went on his way.

Burnett was good company, however, so Ora got along fairly well until one day the two had a quarrel over some small matter. From that day until Eaton left they did not exchange a word, even on matters connected with business, all of their transactions being carried on by means of notes.

Eaton would cook the breakfast, and,

after eating his own, would call Burnett from the sleeping-room in back, place his breakfast on the table, and, when Burnett appeared, would retire to his sleeping quarters, there to remain until awakened by Burnett to supper, which he, Burnett, would cook.

This state of affairs continued for about six weeks. The matter weighed heavily on Eaton's mind. He was a sociable chap and longed for companionship. He told me the story afterward, how he suddenly went "dippy," and held up a freight-train over five hours merely to break the monotony which had gotten on his nerves.

One night, after getting up when called by the agent, he felt very despondent, and determined to resign, to take effect as soon as relief could be sent. Upon going to the office, Burnett immediately retired to the rear. Eaton ate his supper, cleared away the table, washed the few dishes, lit his pipe and settled himself down to read.

Everything was as quiet as death. The moon shone from a perfect sky, as bright as day—such a moon as is seen only in western Texas, on the plains, dazzling white, big and majestic, sailing in the heavens, and seemingly almost within reach. Eaton sat alternately reading and listening to the chattering of the telegraph sounder until midnight.

Then, hearing the despatcher calling him, he answered.

"Copy three," said the despatcher.

Copied "31" Order on Floor.

Eaton removed his feet from the telegraph table where he had had them elevated; but in the act he succeeded in knocking to the floor his pile of "31s," scattering the carbon sheets in every direction. Not having the time to make a new book, Ora grabbed a piece of chalk which was handy and copied this "31" order on the office floor, *à la* "Face on the Barroom Floor," of fond memory:

> Train No. 26 may use 5 hours and 30 mins. on the time and rights of Train No. 5.
> 31. R. H. I.

This meant that Train No. 5, otherwise known as the "Sunset Limited," which was the crack train of the road, was five hours and thirty minutes late, and gave Freight Train No. 26 permission to proceed as far as possible in this time, which would ordinarily take it to the division terminal at Sanderson.

Eaton Goes "Nuts."

Eaton turned his "bug" red to halt No. 26, which soon came puffing down the main, stopping a couple of hundred yards north of the depot. Right here is where Eaton says he went "nuts," for no sooner did he see the conductor and engineer coming toward the office in the bright moonlight than an irresistible desire for excitement and companionship overcame him. Right then he determined, he said, to have all of both that he could hold at one sitting.

And he did.

First stepping to the door that opened from the office to the living-rooms in the rear, he quietly turned the key on the sleeping Burnett, then, fearing that he might become tender-hearted, threw it away, far out on the prairie. By this time the train-crew was within a hundred feet of the office. Eaton grasped the Winchester rifle that was part of the equipment of every station on the division, and, lifting it to his shoulder, drew a bead on the advancing train-crew, calling out to them:

"Back in the siding, you slab-sided hunks of cheese, and do it quick! Sabe?"

"Gimme some time on No. 5," called back the conductor, "Shorty" Organ, thinking that Eaton was joking.

"Time rats!" responded Eaton, pulling the trigger, and a .45 Winchester bullet whizzed uncomfortably near Shorty's head.

Shorty ducked, as did also "Pop" Lambert, the engineer, and the head brakeman who accompanied them. They then realized that something was wrong, and that little Eaton—he was only about five feet three, and weighed about one

hundred and ten pounds—meant business; so, deciding that discretion was the better part of valor, they beat a hasty retreat, and backed their train in the siding.

In the mean time Burnett, who had been awakened by the shot and the shouting, was pounding frantically on the door and demanding to be let out. Eaton fired a bullet through the closed door, barely missing the agent's devoted head, at the same time advising Burnett to lie down and be good, which Burnett concluded he had better do, as he was not quite prepared to join the vast majority at that time.

Opened Every Circuit on the Road.

In the mean time the despatcher, Ellsworth, at El Paso, was keeping up a tattoo on the telegraph sounder, calling "MO," the call for Marathon. Eaton became exasperated at the persistent calling, and, stepping to the switchboard, pulled every plug from that very necessary article of telegraph equipment, thus opening every circuit on the road and rendering them useless.

Eaton then seated himself on the telegraph table in the bay window of the office, with his trusty Winchester across his knees. Whenever he saw a form creeping toward the depot he would take a pot-shot at it; but luckily none of the shots took effect, although there were a number of narrow escapes.

Burnett was safely locked in the rear room, the only entrance being through the door leading to the office. There were two windows, but they were strongly barred with steel bars on the outside, which he found it impossible to remove.

Eaton sat in the bay window throughout the night until about 5.30 the next morning, when the Sunset Limited whistled for the station. When the train slowed up, Ora made a wild dash for it, throwing down his gun in the office before taking his hurried departure.

Telling Dan Anderson, the veteran conductor, that all the telegraph wires were dead north, and that he was going to locate the break, he placed his thumb to his nose and derisively wriggled his fingers at the swearing, thoroughly disgusted crew of Freight Train No. 26, which had stood on the siding for nearly six hours to furnish excitement and companionship to a poor, locoed operator who saw too much of solitude.

Eaton rode No. 5 in to El Paso. On the way he became somewhat violent, and upon arriving at that point was taken to a hospital, where he was confined for six weeks or more, suffering from a severe attack of brain fever.

I was working nights at Haymond, the next station south, when this happened, and can vouch for its truthfulness. I heard afterward that late in the morning Burnett was liberated from his involuntary imprisonment by a soldier from the military post.

As Eaton had carried away all of the plugs from the switchboard, it was impossible for him to cut in his instruments, although he succeeded in closing the wires by running "jumpers" over them at the top of the board, thus restoring communication between the despatcher's office and all other points on the division except his own.

Some of the Old-Timers.

We had some star telegraphers on the El Paso division of the G., H. and S. A. Railroad at that time. Among them were George Barber, now president and general manager of the Barber Storage and Warehouse Company, East St. Louis, Illinois; Barney Dugan, sometime United States consul at Rio Grande do Sul, Brazil; Henry Walters, now a member of a prominent firm of lawyers in San Francisco, and "Jack" Mundy, who died some years ago in Vera Cruz, Mexico, where he was connected in some official capacity with the Vera Cruz and Pacific Railroad.

Among the more prominent and best-known conductors were "Shorty" Organ —called "Shorty" because he was only six feet three in his stocking-feet—who

was known all along the border as a fearless man as well as a first-class railroader; Dan Anderson, conductor of one of the first Sunset Limited trains that the Southern Pacific ran; "Billy" Tuthill, famous as a crack shot, and Frank Woodhull, well known in early church circles in El Paso.

All were of that type of old-time Western conductor, of whom there are but a few left to sing the glories of that bygone day—well known and loved by all who knew them, and everybody knew them on the division over which they ran. Ever ready to do one a favor, and not bound around with red tape, the conductors of that road at that time were sole masters of their trains, once they signed the register for an outward trip.

"Bach" Telegraphers Filled Up on Quail.

As I mentioned before, I was the night operator at Haymond, a station somewhat like Marathon, with nothing there except two "dobie" shacks, which were occupied by the Mexican section-hands. The agent and day operator was "Billy" Robinson, as fine a fellow as ever lived.

Quail and game were very plentiful in our vicinity. At times some of the above-mentioned conductors would take a short layoff and come and spend a day or two at our place for the shooting. Many are the pleasant days I have spent in their company tramping across the prairie with a gun over my shoulder.

Robinson and I "bached," of course, and as he was an excellent cook with the birds, deer and antelope, we fared exceedingly well. My mouth waters when I think of the many good things that he prepared for our joint consumption.

We had for a companion a wall-eyed, floppy-eared, sweet-voiced Texas mocking-bird, which we had named Napoleon. This burro was the pet and mascot of the entire division. It was said that he knew almost as much as the average fireman.

Whenever Napoleon raised his voice in song, which he usually did in the dead watches of the night, or between the hours of 2 and 3 A.M., the earth fairly trembled, and the stars ceased their twinkling, while old Napoleon poured forth his old fool soul in rhapsody.

Napoleon made it his personal and particular business to be on hand on the arrival, departure or passing through of any and all trains. Even if he should be browsing at a distance on some choice titbits of cactus, as soon as he heard the whistle of an approaching train Napoleon would suspend all other business forthwith, would kick up his heels, and light out for the station lickety-split. There he would stand by the track in front of the office window with his ears elevated, head thrown back, greeting the approaching train with the most ear-splitting series of "hee-haws" that ever emanated from the throat of a well-bred jackass.

This same habit of Napoleon's, of greeting every coming and passing train, saved me my job once, and, perhaps, saved a bad wreck and possibly considerable loss of life. It happened this way:

I Slip in a Nap on the Road's Time.

Dan Anderson, passenger conductor; Frank Woodhull, freight conductor, and George Stewart, first-trick train-despatcher, had taken a lay-off and run down to visit us for a day's shooting. I had accompanied them on their long tramp over the prairie. We had tramped all day long, bagging considerable game, besides a large number of quail.

We returned to the depot about six o'clock, where the visiting party caught a north-bound train for their homes. I was about all in from the long tramp, having worked all the previous night, so Robinson offered to work for me until ten o'clock, which offer I was glad enough to avail myself of. At the specified time he called me and he turned in. I managed to keep my eyes open for a couple of hours, but it was hard work.

Shortly after midnight the despatcher called me and sent a "31" order for No. 25, freight-train north-bound, to take the siding and meet No. 26, freight-train

south-bound, at Warwick instead of at Marathon. I repeated the order all right, and got the "O. K." from the despatcher, intending to turn my order-board red after Eaton, the operator at Marathon, had repeated the order and received his O. K.

While Marathon was repeating, however, I laid my head on the telegraph table for a moment's rest, and—immediately went to sleep, with my head pillowed on my arms.

The next thing I was conscious of was the most soul-stirring, heart-breaking noise, like unto the wailing of a million lost souls. I sprang to my feet, terrified, upsetting my chair and a bottle of ink, only to find that that old fool, Napoleon, was standing right outside the office window, which was open, lifting his brazen voice in welcome to the onrushing engine of train No. 25, for which train I had a meet-order with No. 26.

I had barely time to grasp the situation and turn the red board on them before the engine swept by the station. Just in time, too, for "Tom" Moran, the "igle E," had seen the "bug" showing white a mile away, and had opened her up wide when the red bug flashed in his face just as he was passing. He quickly applied the air and brought the train to a stop.

Saved by a (Texas) Mocking-Bird's Song.

Believe me, I was scared! For had not Napoleon wakened me with his hee-hawing, No. 25 would have surely gotten by me, and in all probability would have met No. 26 somewhere between Warwick and Marathon, on a particularly nasty piece of track. Napoleon was something of a favorite with me before, but after this incident there was nothing too good for that poor, misguided, long-eared burro.

No one knew where Napoleon came from. No one cared. We only knew that he came to us on the fresh dewy morn of an April day just as the stars were about to make out their transfers and turn the job over to Old Sol, and the whole earth was wrapped in peace and slumber, and asked to be loved.

He poked his long-eared head into the open window of the room where Robinson was industriously hitting the hay while I dozed off in an armchair, and asked for our affection in such a long-drawn, heart-whole way that we could not deny him. When Robinson threw a boot at him and he calmly set to work to devour it, we immediately adopted him.

He remained with us until his tragic end, which came through too much enthusiasm in greeting an oncoming passenger-train and getting too close to the track. We picked up the remains of poor Napoleon with a piece of blotting-paper.

Train-Despatchers Earned Their Money.

The train-despatchers on the G., H. and S. A. had no easy thing of it, I assure you. The division over which they had charge was about five hundred miles in length, all single track, and comprised four freight divisions, or, to be more exact, three freight divisions and a turn around or sub-division.

The latter was Sierra Blanca, a piece of track about sixty miles in length, used jointly by the Southern Pacific and the Texas and Pacific Railroads, but being run by the despatchers of the G., H. and S. A.

The next division point south is Valentine, then Sanderson, and last, Del Rio. What do you think of that, you modern, latter-day despatchers with your one hundred and fifty or two hundred miles of double track, with no meeting-point to make, with your automatic blocks and other safety devices?

On the district between San Antonio and Del Rio—which is now a part of the San Antonio Division, but which was at that time under the jurisdiction of the superintendent of the El Paso Division, although handled by the despatchers at San Antonio—there is a station called Spofford Junction. Here the Galveston, Harrisburg and San Antonio has a branch

line running twenty or twenty-five miles west, to Eagle Pass, and across the Rio Grande, connecting with the International of Mexico at Ciudad Porforio Diaz, a town whose name has since been changed back to its original one of Piedras Negras.

For many years "Jim" McCarthy was the sole conductor on this branch, making connections at Spofford Junction with all the passenger-trains on the main line, and running the "stub" to Eagle Pass, besides running a freight-train each way daily. Jim was an old Indian and border fighter, having been born and raised on the frontier, and many are the tales of adventure he has related to me while waiting for some delayed train.

The agent at Spofford Junction was, and, I understand still is, Otto Zohl, who took charge of this station when it was first opened in the 70's, and has been there continuously since that day, unless he has been removed or has passed away.

The Famous Old "X-10-U-8."

Spofford Junction contained about a dozen houses besides the depot. Among these was a hotel known from the Gulf of Mexico to the Pacific coast as the "X-10-U-8."

This resort was conducted by two famous old stage-coach drivers and former United States army scouts, namely, "Bill" Pratt and "Jim" Molloy, doing business under the firm name of Pratt & Molloy. These two old battle-scarred veterans had located here when the railroad came and took away their vocation of driving stage between San Antonio and Brackettville, or, as the military post was called, Fort Clark, located only a few miles away from Spofford.

The two had been drivers on this route for a number of years, and were boon companions, so when the stage-coach line was abandoned, they opened the X-10-U-8 on the site of the old stage station at Spofford. There, probably, their descendants hold forth under the same unique name and style of firm.

This place was a veritable museum. Everything that the old wild and woolly West produced in the way of animal life was to be found here stuffed and mounted; every style of weapon used in the Indian and border warfares was hanging on the walls, and each and every one of them had an interesting history behind it, which was wound around one of the partners—Pratt or Molloy. When the overland trains came to a stop at the station the tourists would make a dash across the road to the X-10-U-8 to view the curios and to have a look at the noted frontiersmen.

Fort Clark, as I have mentioned before, was but a short distance away, and Spofford Junction was a favorite loafing-place for the soldiers who were on short leave. There was no drunkenness, however, as the X-10-U-8 was unique in the fact that it refused to serve more than six drinks per day to any one man, and these six drinks must be punctuated by periods of two hours between each drink. This rule was rigidly adhered to during the lifetime of the two original partners.

Rare Sessions at Spofford Junction.

Spofford Junction was a subdivision at this time, so the boys used to gather in the back room of the X-10-U-8 and swap reminiscences of the early days of the road during its building and first operation.

I assure you, gentle reader, that there were more fast runs made, more bad wrecks, more wrecks narrowly averted, more coal consumed, more ash-pans dumped and fires cleaned, and more classy railroading in general, done in that back room on those nights than has been done on the whole great Southern Pacific system since it was built, or, more than is usually done around the dinner table at a brakeman's boarding-house; for, take railroad men as a whole, no matter what their position, be it section hand or general manager, when they foregather they are the most prolific "shop-talkers" the world has ever produced.

"30" FOR W. L. WAUGH.

A. P.'s Star Telegrapher Sat In at Every National Political Convention for a Generation.

W. L. WAUGH, the star telegrapher of the Associated Press, died of pneumonia last summer, only a few weeks after he had been compelled by ill-health to take retiring-pay. Mr. Waugh had covered every national political convention held in this country in the last twenty years, with the exception of those held last spring. He also took part successfully in a number of telegraphers' tournaments.

At the Bunnell contest, held at 195 Broadway, New York, August, 1884, Waugh won the first prize, a gold medal, by sending five hundred words in 11 minutes 27 seconds. This record has not yet been surpassed in any official contest. In 1903 a cash prize of three hundred dollars, as well as the championship of America, was won by Harvey Williams; but Mr. Williams took 11 minutes 30 seconds — three seconds longer — to send a message of equal length.

THE LATE W. L. WAUGH

MR. WAUGH'S BEAUTIFUL MORSE IS A TRADITION IN THE ASSOCIATED PRESS SERVICE

A statement issued from the offices of Melville E. Stone, general manager of the Associated Press, said in part:

> For the first time in a double decade, the Associated Press, during the recent national political conventions, was without the services of one who, in the past, had flashed to the world the nominations of half a dozen Presidents and Vice-Presidents, and the candidates who had opposed them.
>
> In past years Waugh, seated on the chairman's rostrum, a secret sounder strapped to his ear, hand toying nervously with his key, rolled out in perfect Morse the history-making story as it flowed from the dictating lips of the news men. Excitement and turbulent scenes bothered him not at all, each character flowed as clearly as though cut by a die, the rhythm velvety in smoothness.
>
> "Fat's" beautiful Morse is a tradition in the Associated Press service. Even in the last years of his service, when his health had begun to fail, Waugh could still send with the best of them. A bit of the "velvet" might have been worn off, but his "arm" still was good and his speed undiminished.

Born in Fulton, New York, in 1860, Waugh entered on telegraphic work in 1872 as a messenger.

THE SILK-TRAIN.

BY LYDIA M. DUNHAM O'NEIL.

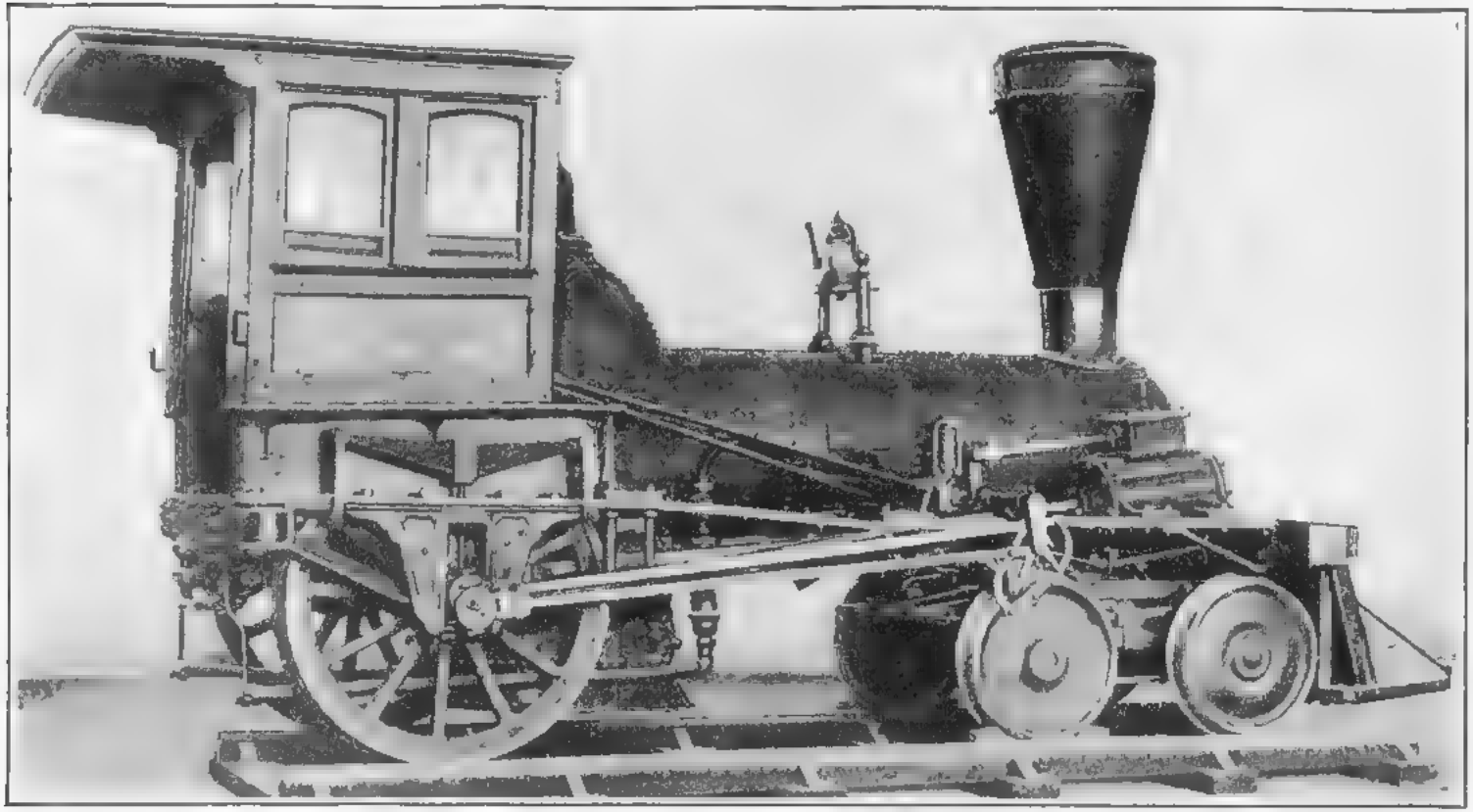
HIGHBALL! Highball! She is on her way!
Out of the yards in the twilight gray,
Gathering speed with each turn of the wheel,
Pounding impatiently over the steel,
Her headlight dimming the light of the stars
That, wondering, gaze on the thundering cars.
Clear of traffic the rails to-night,
For nothing may dare delay the flight
Of a train of silks from Frisco.

SWIFT inspection, but careful and true;
Change of engine and change of crew.
Highball! Highball! She is on her way,
Eastward bound at the dawn of day!
Side-track the Pullman, express, and mail—
Gilded aristocrats of the rail;
One with another they three may vie,
But all must bow when the Queen goes by—
A train of silks from Frisco!

DOUBLE-HEADING the mountains steep;
Drifting down through the gorges deep;
Making the walls of the canyons ring
As the shriek of the whistle goes echoing—
By dark and day she is hurrying on;
The gray of dusk and the gray of dawn,
The whisp'ring zephyr, the howling gale,
Are one and the same to the queen of the rail—
A train of silks from Frisco.

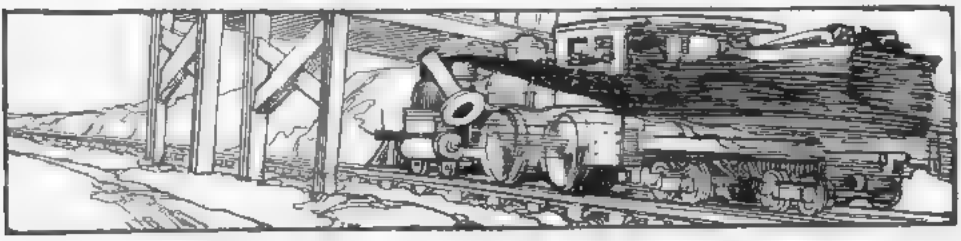
O'ER the deserts gray and the prairies green,
And all the country that lies between,
With shriek of whistle and whirl of wheel,
She follows the ribbons of shining steel.
Highball! Throw the levers! The tracks are clear!
The precious cargo is near—is here!
The continent crossed, her dangers done,
She throbs with pride at the end of the run—
The train of silks from Frisco!

FIRST LOCOMOTIVE WEST OF CHICAGO.



IN 1848 THE GALENA COMPANY, PREDECESSOR OF THE PRESENT CHICAGO AND NORTH WESTERN, SWAPPED A BUNCH OF ITS STOCK FOR ONE (SECOND-HAND) LOCOMOTIVE, WHICH WAS PROMPTLY CHRISTENED THE "PIONEER" BECAUSE IT WAS THE FIRST STEAM VEHICLE TO PULL OUT OF CHICAGO HEADED WEST. THE ENGINE, WHICH WAS BUILT BY THE BALDWIN LOCOMOTIVE WORKS, WEIGHS ONLY TEN TONS AND HAS BUT ONE PAIR OF DRIVING-WHEELS, THESE ARE OF FOUR AND ONE-HALF FEET DIAMETER

Tales *from the* Knights *of the* Railroad Round-Table



THE BALD WOOD-BURNER.

BY CHARLES S. GIVEN.

"HOW many of you chaps ever saw an old wood-burner in action?" asked Tom Harding, ex-plug puller, of the boys holding down the bench at the roundhouse.

Conductor Haskell was the only one who pleaded guilty.

"I've been there with both eyes and my breathing apparatus," he replied.

"That sounds like the real article, Jim, and reminds me of old times," responded Tom. "I'm going to tell you of an experience of mine back East, in the fifties, when wood was the only locomotive fuel.

"I had been firing about three years for Sam Cash on light local passenger. It was a short run, in so far as the distance between terminals goes—thirty-two miles — but we made three round trips a day, which totaled a long day's run.

"Waterford was our home station and Hillsboro our eastern terminal, with a number of small stations and two cities between. We hauled a combination smoker and baggage-car and one coach on the morning and evening trips, and one extra coach on the noon trip.

"In those days railroading was vastly different from what it is now in many ways. For one thing, after a man had fired a couple of years he was regarded as capable of running his engine if he ever would be, and when the engineer laid off, nine times out of ten the fireboy to return to work on Monday.

"Sam was off, sick, and I had been running the old Augusta for two weeks. Saturday was my last day, as Sam was to return to work on Monday.

"I would have liked to hold down the right-hand cushions a little longer, but on this last day I got such a bump that I changed my mind quickly, and did not care if I never rode another foot on a locomotive.

"Some of those old wood-burners had enormous smoke-stacks, large in girth, and as tall as they could be made and still clear the overhead bridges. These were called balloon stacks. Another

style we had were like a straight stack until near the top, where they flared out, and some of 'em were three feet across the top. Sunflower stacks, they were called. They were rakish-looking, and added much to the appearance of a locomotive. Although they were no taller than the balloons, they looked so.

" Our engine, the Augusta, had a sunflower stack.

" There were two bridges on our run that were lower than all others, and our stack cleared them just two inches by actual measurement

" The road-beds were not rock-ballasted in those days. The gravel ballast was light, so, consequently, when the frost began to work out in the spring, it raised the deuce. Some pieces of track would be shimmed up for a quarter of a mile to make the track smoother.

" These wooden shims varied from an eighth of an inch thick to four inches, according to how high the rails had been raised out of line. At overhead bridges in particular the track hove badly.

" On the Saturday in question I never saw the road so rough before. The sectionmen all up and down the line were shimming up the rails

" There was a particularly high spot at the north side of the Harland Bridge, which was the lowest overhead bridge on the line with one exception.

" The sectionmen had just begun to work there when I ran up on my four o'clock trip. I made motions for them not to raise the rails much, and pointed to my stack. The foreman gave me the all-right sign, and I thought no more about it.

" We got delayed on the return run, which we made after dark, and the Augusta was shy on steam, so I was getting all I could out of her when we approached the bridge. There was a crash out front, followed by more fireworks, as our stack hit the bridge, broke off at the collar, was swept back along the boiler, hit the cab on my side, breaking the front window, and then dropped into the ditch.

" I shut off and squealed for brakes. As the smoke rolled back along the boiler, filling the cab, I got down behind the boiler-head, gasping for breath, and was mighty glad when the wheels stopped turning and I swung down. I went out front to get out of the smoke and look things over.

" By some means the base of the stack had come in contact with the headlight and knocked it off the baseboard. It was just as well, for all the use it would have been to us, for we never got a glimpse of the track ahead after the stack went overboard

" If anything could equal an old wood-burner as a smoke manufacturer I have yet to see it, and there was nearly as much smoke when the engine was standing as when working steam.

" We were running south; the wind was from the south, and the way it penetrated every nook and corner of that cab, and the interior of those two cars, was something fierce. We could do nothing to help things out, and so pulled into town, a mile away.

" How the fireboy and I ever managed to hold out until we got there is a mystery. We shut all the windows, but it just poured in through my broken front window. We couldn't put our heads outside for a second; there was no relief to be found in the gangways.

" Our eyes smarted and ran water so that we could not see. We coughed and strangled and almost had a fit.

" The moment we came to a stop at the station, we both staggered to the platform and got out of the range of the smoke, and almost collapsed. It took us all of five minutes to get our wind back. I hunted round and found two short boards, and after several attempts, succeeded in nailing up my front window.

" We had twelve miles yet to cover. It looked like an impossibility. The Augusta was steaming hard enough before, but now we had hard work to keep her hot enough to turn the wheels.

" We pulled slowly out of town. Luck-

ily for us, we had very few grades to buck; the worst of these was a mile north of Waterford.

"In spite of the boards over my front window, the smoke sifted in fierce. We could not see ahead.

"The smoking-compartment of the combination car was next the engine. The passengers were smoked out, and had gone into the coach, where they were not much better off.

"The steam kept going back on us, and three miles out we were glad of an excuse to stop and blow her up. We could not have held out over the whole six miles to Crowly's.

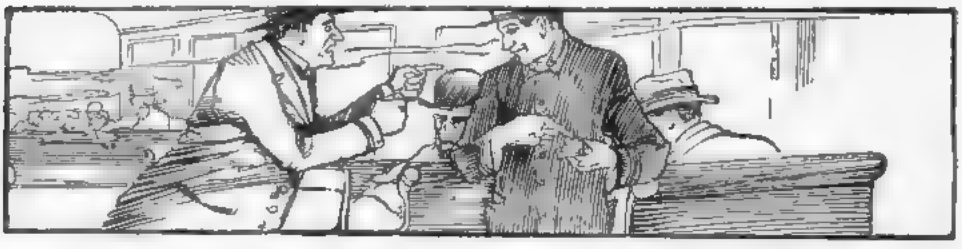
"We recuperated, got our breathing-apparatus working, got a little more steam on, and started again. We arrived at Crowly's in pretty bad shape. It did not seem as if we could continue the run, but we would have to try it.

"We had a grade to start on, and couldn't get 'em turning. Backing up three-quarters of a mile, we got a little start, and succeeded in keeping 'em in motion for about three miles; then, after half an hour's delay, we pulled 'em to within three-quarters of a mile of Waterford. There the Augusta lay down and out. The passengers gave up in disgust and hoofed it into town.

"Leaving the Augusta in charge of the conductor, the fireboy and I walked into town to the engine-house to get the Bates, the work-train engine, to tow our engine and train in with. We found the Bates cold, and it required two hours to get up steam.

"We were due in Waterford at nine o'clock; we actually pulled our train in at half past one, the most disgusted engine-crew that ever stood on an engine's deck. We were black as coal; our eyes felt as if there were pins sticking in them; our lungs pained us; and it was three days before I felt equal to throwing wood into the hungry furnace of a wood-burner once more.

"Running a bald-headed engine certainly has its drawbacks, unless you run them backward."



THE GOAT-GETTER.

BY P. G. ESTEE.

IT was while working out West (remarked the trainman) that I saw one of the professional "goat-getters" get his. By professional, I mean one of the despicable creatures who insult, browbeat, or hector some station or train employee until the latter, at the limit of his endurance, gives them back as good as they send.

Then the goat-getter promptly calls upon all present for their names, and a little later there is a threatened lawsuit. The railroad company generally settles, and discharges the employee. It's the only way. A jury invariably takes the side of the citizen; especially if he is on company ground and the employee in uniform—no matter what the provocation.

The public figures that it is "getting one" on the corporation, but the poor employee is the real sufferer. The employee does only what any one else would do—protects his honor and dignity, and gets switched off the right-of-way.

Sometimes the goat-getter is actuated merely by a mean disposition. The professional makes a business of it. One of the gentry confided to me the fact that it paid well, too; three to four thousand per year.

It was on a local passenger between Ellensburg and Toppenish that I saw Conductor well, call him George—give a splendid exhibition of self-control. I was riding in the smoker, and the fellow—a professional he was—was two seats ahead of me. I had not noticed him when George took his ticket; but the man's loud demand for a return portion attracted my attention.

George was one of the finest fellows I ever met; a gentleman every minute of the day. He ignored the quarrelsome tone and attitude of the fat-faced, bull-necked chap, and drew out all the tickets from the pocket of his blue coat.

There was no return form from Ellensburg to Wapato. There were, however, several one-way forms between those points.

"As I remember it, your ticket was one way only," George said mildly.

"Gimme back my ticket, you robber!" shouted the man.

George merely looked at him for a full minute—sizing him up, I guess.

"I have nothing that belongs to you, sir," he said as quietly as ever.

"You lie!" snapped the fellow.

I am afraid my self-control would have gone flying, and I looked to see George hand him what he deserved, even if the conductor was in uniform. Instead, George balanced himself in the aisle and spoke as calmly as if interpreting a folder for an old lady.

"Son, I have worked twenty-five years for this run, and I am not going to let a man like you get it from me—and a thousand or two with it. I will, however, furnish you transportation to Pasco and back to Wapato if you will ride in with me and wait until I register off duty."

Fair play was no part of the bully's plan; he merely uncorked another volley of abuse. George moved deliberately on.

Well, sir, every time the conductor came through the fellow tried to pick a quarrel, and was met by unsmiling but courteous words. More than once I saw George's right hand clench until the white of his knuckles showed, but he held himself.

We reached Wapato right on time and found the red against us.

"Blocked yard at Toppenish," the operator explained. "Everything tied up. DI says 'get in,' for delayed No. 1 and the G. N.'s Oriental is coming behind them account washouts on their line."

"How long will we be here, do you think, son?" queried George with sudden interest.

"Thirty to forty minutes, anyway," grinned the operator.

"Ask DI if he will consider me off duty for fifteen minutes while I look after a personal matter up-town," he ordered.

"Says, 'O. K.'"

Two minutes later George, in his "civilians," hailed me.

"You on a vacation, I take it, Guy. Come up-town; I want a witness."

I trotted along, glad of the chance, for I saw some fun ahead.

Well, we sauntered along, and sure enough, in front of the first drug-store, there was our friend. He was talking loud:

"I told him the whole railroad force couldn't bl—"

He happened to meet George's eyes just then, and, mumbling something about business, started away. Not fast enough, however.

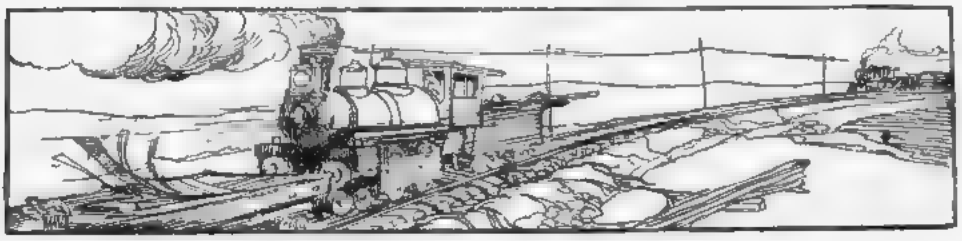
George was well known in "WA."

"Boys, I am the conductor he was blackguarding," he said. "Just see fair play, will you?"

The things he did to that chap were

many and varied. When it was over, the goat-getter did not go to the hotel under his own steam. He was carried.

George showed few marks and no excitement. He was back and in his blues in exactly fifteen minutes by the clock. No legal proceedings were ever started. I think one man changed his vocation right there and took up some better pursuit than that of ragging conductors.



A DOUBLE-BARRELED WRECK.

BY FLOYD T. WOOD.

EVERYBODY said it was a peculiar wreck, said the fireman. Some of the features were new to the boys here—even unto the earliest memory of the oldest rail on the division. It happened one August afternoon. I was working that summer on a construction-train, grading and filling in for the big yards of the new repair-shops the L. M. were putting in at Arden.

We were not far from town. We were about a mile from the west switch at Arden to the bridge over the Arrow River, and just over the bridge was the entrance switch to the East Port freight-yards. Continuing west, it was about four miles farther to the station, with one big curve about midway between.

From the bridge east the track bent to the right and then made a sharp curve around the base of a scrubby little hill. It was quite impossible to see from one yard to the other; also, the road was a single-tracker. Notwithstanding these drawbacks, which were very real ones, the switch-crew who were doing the transfer work between Arden and East Port had been smoking back and forth all summer.

I think every one understands what smoking is—merely keeping track of the different trains as closely as possible, and beating it out between without orders or running-rights of any kind. There is no come-back as long as Good Luck stays on the job; but this day the fickle goddess had booked a rest or taken sick. Anyway, she wasn't around.

Our whole crew were sitting around the operator's shack near the west switch at Arden, waiting our turn to go down into the loading-pit. At 2.30 P.M. No. 6 was due out of the station. No. 73, a fast daily freight, was supposed to make East Port yards just in time to clear No. 6.

No. 73 was usually a train of red cars, and on time. On this day she was a few minutes late, so in order that valuable freight might not be uselessly delayed the despatcher put out an order that No. 6 would run five minutes late from East Port to Shiller, a little burg about nine miles east. This was not a general order; it was only delivered to No. 73, as she was the only train affected.

Perhaps its very insignificance was the reason the switch-crew neglected to receive a copy; as far as they knew, No. 6

was on time. Our operator heard it going over the wires and repeated it to us, and we sat there, idly wondering if such a small allotment of time would be sufficient for No. 73 to make in with. A spreading cloud of black smoke in the direction of Shiller gave us a partial answer.

"She's going to make in," I remarked, "or try darn hard. From the looks of that smoke-pile, I'll bet the fireman is busy."

It was just two-thirty, No. 6's leaving time, when No. 73 swung round into view. They were sure making the time. The white feather trailing out behind was visible proof that they had plenty of fog, and the sharp bark of the exhaust was additional proof that they were making good use of it.

"It's a cinch," said some one. "The way they're rolling they'll clear No. 6 two or three minutes easy."

The words were barely out when we heard from the direction of East Port two short, sharp toots. We all knew the whistle; it was No. 2309—the switch-crew's pig.

They were either answering a signal or whistling off for Arden. Which was it? If it was the latter, things were about due to happen.

No one cared to flag No. 73, lay out No. 6, and if wrong jump into all kinds of trouble. But those two whistles—they were full of possibilities.

No. 73 flashed by. They had a good, speedy mill; she was hooked well up; they were cutting off the miles like a passenger. Two or three of us raced alongside as they roared by and shouted at the shack and the fireman, who were leaning out of the window.

"Look out around the curve!" we shrieked. "Look out!"

But we might as well have saved our breath. The two only grinned and waved at us; I guess they thought we were peddling some of the hot air of the road.

We waited, half-expectant, half-fearful, as the train disappeared around the curve. They were barely half around when we heard a wild, double wail from the whistles; the caboose on No. 73 almost stood on its head, so suddenly it stopped. A big cloud of smoke, steam, and water burst into view, high over the top of the hill that made the inside of the curve. They were together.

We ran for the scene of the accident. It was just as we had feared. The switch-crew had waited till No. 6 was due out of the station, figured No. 73 was stuck somewhere on the road, and pushed out over the switch and high-balled for Arden. They had only one car, a load of lumber, which they were pushing ahead of them. Their engine, old No. 2309, was far from being a speedy machine, but they had her doing the best she could.

When No. 73 shot round the curve the crew saw on the instant that a smash was inevitable. The foreman and one helper were on the car. They unloaded, and they beat the world's record for similar events.

The foreman hit the ground and kept right on going. No one ever saw him around East Port after that; he didn't even wait to take his wife.

The fireman took to the prairie on his side. The engineer shot on his air, reversed her, pulled the throttle wide open, and dived through the window. His clothes caught on the brake-valve as he went. The brakes released; when they struck, the goat was already moving in the opposite direction. The thirty-per bump started her off at a great pace.

The car between the two heavy engines was almost completely demolished. Some of the lumber skidded along the boiler of No. 73's engine, smashed through the front cab windows, and ended up on the tender. The flying glass cut the engineer slightly, but the fireman was unhurt.

What was left of the car No. 2309 took with her on her wild retreat. The more insecure pieces fell off when she hit the bridge, and the remainder struck the switch-stand on the opposite side, broke away, and went rolling down the embankment.

There were a number of other yard-crews working in East Port yards; they guessed that something was wrong when the runaway tore by, but they could do nothing. She was going too fast.

No. 6 rounded the curve just a very little after the wild engine crossed the Arrow. The engineer saw the approaching engine, of course, but thought it was only a bunch of reckless yardmen hurrying to get into clear in some one of the numerous spurs.

When he realized, from her nearness and the swiftness of her coming, that this supposition was wrong, it was too late even to stop his own train. He jammed the brake into emergency and leaped from the gangway; the fireman and coal-passer went out the opposite side. The engineer fell with a twist; his leg was broken.

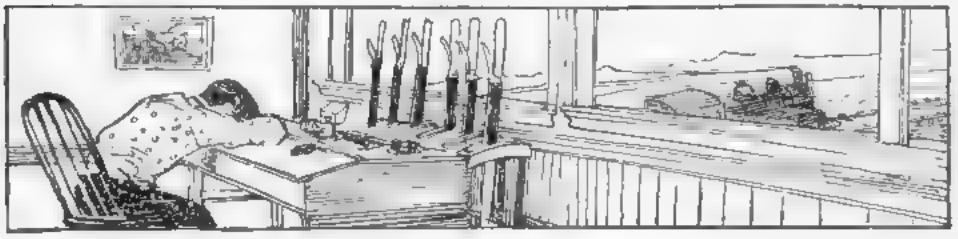
There was a grand crash. The tender of the yard-engine was completely demolished; the passenger-engine was put out of commission for several weeks. But beyond a severe jolting and the fright no one was hurt on the train.

No. 2309 was indeed a sorry mess. She had been bad enough from the first wallop, but now that the tender had crumpled up and tried to crawl into the fire-box she was certainly finished entirely as an artistic product.

The engineer on the goat had been unfortunate enough to lose a leg in a mishap some time previously. The officials did not wish to fire him. At the investigation he was asked:

"Why did you reverse your engine and then leave her to run wild?"

"Huh!" he replied tersely. "I lost one foot already; you want me to lose my head, too?"



THE VANISHING HEADLIGHT.

BY F. B. LOVETT.

MY most trying mishap in the handling of train-orders (said the operator) occurred early in my career. It happened the second night on my first telegraph job. Southern Junction, the station to which I had been assigned, was merely a crossing of tracks in northern Arkansas. During my first night on duty I had not copied a single order, and my second tour began as though it would be a repetition of the first.

I was very young, and youth is prone to drowsiness, especially when enveloped in the seductive atmosphere of a soft Southern night. As the moments passed, I frequently caught myself nodding. Like all youngsters, I was keenly alive to the importance of my position, and I made strenuous efforts to keep awake at least until the passenger special had passed.

On its schedule, this train was due at the junction at eleven o'clock. It met a red-ball freight at Waterville, fifteen miles below. This much I had gleaned from listening to the train-wire. I last remarked the time at 10.15, and then the arms of Morpheus enfolded me.

The frantic and insistent repetition of

my office call awoke me with a guilty start. Approaching the telegraph table in some trepidation, I answered:

"I, I, SJ."

"OS passenger extra," ordered the despatcher.

I looked at the clock. The time was 11.10, but I had no knowledge of the passenger extra's flight at Southern Junction. Leaving the key open, I hastily scrambled to the track. Looking west, I saw a bright headlight, undoubtedly that of the approaching special.

"Coming, about two miles away," I reported.

"Put out your board; 31, copy 3," ordered "DS." I displayed my signal and copied the following order:

ORDER NO. 92.

To C. AND E.,

Special Extra No. 222 West, SJ.

Order No. 86 is annulled. Special Extra No. 222 west will run ten minutes late—Southern Junction to Waterville—on Schedule Order No. 71 and meet No. 52 at Locke instead of Waterville. W. W. B.

I repeated and received O. K. for the order, congratulating myself meanwhile that I had awakened in time to be of service. Five minutes passed, and as the passenger extra did not put in an appearance I went out for further observation.

The headlight to the east gleamed as brightly as before, but I heard no sound of an approaching train. To the west I heard a faint rumble, but this, I concluded, was from No. 52, which had signed up for Order No. 92 at Waterville.

"They must be in trouble," I reported to DS. "They seem to be standing still about where they were when I first saw them."

"O. K.," he replied. "Let me know when they show up."

Taking it far granted that an accident of some sort was delaying the passenger extra, and knowing that one of the crew would arrive shortly if the train was disabled, I made no further inquiry into the matter until twenty minutes had passed. Becoming uneasy, I again went outside.

To my consternation the headlight had disappeared. Unbroken silence and darkness enveloped the track to the east.

To put it mildly, the discovery knocked me silly. Perspiration, the cold, clammy kind, burst from every pore. Visions of terrible disaster, superstitious flights in fanciful swamp-lore, and other visionary fantoms assailed me all at the same time.

I returned to the office, but at first my trembling fingers refused to form the Morse characters, and it took ten minutes to make the despatcher understand that the headlight had disappeared.

"Gone out," he suggested laconically. "Don't get nervous; it will show up again."

I hoped so, but didn't believe it would.

Locke was a blind siding six miles east of Waterville, and the special extra was scheduled at forty-five miles per hour. If it had passed me on time a head-on collision beyond Locke was inevitable.

This knowledge, coupled with the mysterious disappearance of the headlight, was certainly enough to unnerve one more experienced in complicated situations than I. In a state of helpless terror I awaited developments. Undoubtedly the passenger extra had passed while I slept, and the headlight to the east had been conjured from out the night by some mysterious occult influence. I looked fearfully down the track from time to time, but darkness reigned supreme.

The first intelligence reached me when the passenger special arrived at Waterville. They reported that No. 52 had pulled a draw-bar two miles east of Waterville and flagged the passenger at that point. The special had backed to Locke to let No. 52 by.

I gave No. 52 a clear board and was thankful, indeed, that they didn't have to stop. I was afraid their call might not have been a friendly one.

Of course I expected to get fired, but I wasn't. The despatcher, evidently feeling that I had been scared into wakefulness for the balance of the year at least, covered me up in some way.

It was just a month later, about eight o'clock in the evening, when a light engine stopped and the engineer demanded to know what that was coming against him from the east. He stated that he had no knowledge of a meeting order between Southern Junction and the division point.

I stepped to the track and beheld a glimmering headlight. As before, it showed about two miles to the east. It danced brightly in the distance, but no sound suggested the approach of a train. I reported the circumstances to the despatcher.

"Some farmer with a hay-burner lantern," he suggested. "There's nothing on the pike between here and SJ."

"It's a headlight," I replied with conviction, after consulting the engineer.

"Tell that extra to get moving and investigate," ordered DS. "You can go with him if you want to walk back."

I eagerly accepted permission.

As we approached the annoying headlight, it was apparent that it was not on the track at all, but on an overhead roadbridge that crossed the track above a deep cut.

Uproarious shouts and laughter greeted my ears as I dropped off the engine near an ascent to the bridge. When I arrived on the road above a curious sight met my vision. The headlight, fastened to the woodwork of the bridge, disclosed a bunch of excited plantation hands animatedly shooting dice.

It developed during the ensuing explanations that the railroad divided rival plantations. Once a month—on pay-day—the sportively inclined from each plantation met on the bridge and, via the rolling ivories, transferred the earnings of both delegations to one or the other side of the track. The headlight had been taken from a wreck some months previous, and furnished splendid illumination for such occasions.

The second night of my employment I had discovered the light only a short time before the game broke up, which accounted for its sudden disappearance after I had reported it to the despatcher as an approaching train.

WHAT MADE THEM GRAY.

BY FRANK KAVANAUGH.

"IF Billie wasn't so old—" began the switchman.

"Old!" exclaimed the engineer. "Billie's not a day more than thirty-five! I doubt whether he's that old."

"But look at that gray hair," insisted the switchman.

"I knew Billie when his hair was as black as yours—and that wasn't many years ago. It became white in a night, and after I'm through telling the story, you'll not wonder that his hair looks like that of an older man."

The Fort Worth branch of the Cotton Belt had just been completed (the engineer continued). I was firing then, and

they used those little narrow-gage engines which had been remodeled into standard gage.

The firebox was about as large as a stovepipe hat, and it was only with the greatest of luck that we made that part of the division from Plano to Fort Worth with eight cars. The road was new, glaringly new, the dumps soft, and on one part of the track, in Big Elm creek-bottom, most of the dump had washed away and the track was "cribbed" with ties.

Billie was a kid then, and a wild one. At that time the Cotton Belt was behind with pay, and sometimes we went for as long as three months without drawing anything. Every town in Texas had saloons, and Rule G wasn't enforced as it is now.

Billie had the habit of laying off for a few days immediately after the periodical pay-days. When he came back to work he'd be shaking and broke.

One day I was firing on the first section of a train bound west. Billie was braking behind. It was his first trip since pay-day. The spring rains had set in, and when we got to Big Elm creek-bottom, just after we crossed the bridge, we crept over the cribbed track. Just as we passed over one section of cribbing it gave way under the pressure of the water, and the track sunk.

"Better get out and flag that second section," said the conductor. "We'll send the section-gang from Coppell to get you. They'll take you on to Grapevine to-morrow morning, and you can catch us there."

Where the track had been five minutes before the water was now rushing like a mill-race. Billie took his red lantern and a white one and dropped off. He set the red one on a pole driven into the middle of the track, so that the man on the second section could see it across the washout.

Then he went back after the train. Within a hundred yards he found another section washed out. He was marooned.

It was late spring and the weather was pleasant. It was not such an adventure to stay there until morning. It was just then getting dusk.

So Billie found a dry place at the side of the track, hustled some wood and built a fire. From appearances the rain had ceased for the night.

He lit a pipe and sat down by the fire. The wet wood burned slowly at first, but soon it began to dry out and the fire blazed up. Billie sat and dozed.

He brought himself to with a jerk. A snake crawled slowly toward the fire, got close enough and curled up. Within a few moments another followed suit. With raising hair Billie grabbed his lantern and ran to the washout on the west.

The track was out of sight, and, after wading in a few rail-lengths, he found he could not cross. It would mean death.

He tried the other end of his "island." Same thing. Then he came back to the fire.

Half a dozen snakes, two polecats, a rabbit or two, a small black bear, and a stray dog were gathered around the fire. Soon he heard something swimming in the flood, and a big animal landed near the fire and walked within its warmth. It was a cow.

This was Billie's first trip after pay-day and he was nervous. The thoughts of spending the night with the menagerie didn't appeal to him at all. On either side of the dump were the barrow-pits, probably twenty feet deep; at either end of the island were the washouts.

Once the cow mooed lonesomely and Billie jumped as if shot. The snakes would change positions occasionally, and once, when Billie resumed his seat on the tie, all of them, as if of one accord, moved to where he sat.

The cow, looking at him longingly, moved up closer, also. The bear seemed to want to sit in his lap. Not one of the animals or reptiles offered to harm him, however. They were frightened at the rush of waters and wanted companionship.

It was too much. When the snakes crawled closer and closer Billie with a scream jumped up and ran down the track. He had forgotten his lantern. He stumbled and fell—and lay there.

The second section and the sectionmen from Coppell found him at about the same time the morning following. His hair was perfectly white. Half a dozen snakes were killed around the dying embers of a fire. The cow and the black bear were there. The polecats had vanished

Billie recovered in the Cotton Belt hospital at Tyler. His hair stayed white. That also ended his drinking. You couldn't pay him enough to take a drink of anything stronger than coffee now.

He was set up on the Cotton Belt, and afterward quit that road and came here. When he goes through his train collecting tickets his passengers think he is an old man, but he isn't. In fact, when he married a few weeks ago and took out new life-insurance policies, I think he gave his age as thirty-five.

Men often go through enough to make their hair grow gray (said the despatcher). I had such an experience once. I was working on a main line in Kansas. It was a north and south line. A branch went west from where I worked and I had charge of it, besides the division north and south.

They ran but two trains on that branch, and sometimes for days I wouldn't have to send an order to either. In fact, there were but five telegraph offices on the line.

A local each way a day—that was all. They met near the center of the branch at Wheatville, where each had a leeway of an hour on account of switching-time, so that if one of the trains was an hour late it made no difference.

One night a real blizzard came rushing down from Medicine Hat, or wherever they start from. I reached the office with my ears nearly frozen. The main-line wires were working after a fashion, but the line on the branch was dead.

"Billie," I said to the conductor of the branch local, as he prepared to pull out, "fix up the line if you see where it is down and flag by telegraph if I can't get you and if Meyers (the conductor running opposite) isn't at Wheatville to meet you. They've put up new poles from there to the end of the branch, and I suppose the line is working all right from there on."

"Right O!" said Billie, as he drew his cap over his ears. "I see I've got a lot of passengers to-day."

"Yes," I replied. "There was a teachers' convention here yesterday, and that's what's left of them."

An hour later I took a message from the Big Cheese:

> C., B. & X. track washed out. Arrange to detour their trains to Wheatville

I tried the branch line. It was still dead. Now, the C., B. & X. was a main line and ran a good many trains over their road every day. They had a line from Wheatville to Omaha. Their north and south line almost paralleled ours.

If I was sure Billie and his train was out of the way I could send them over, but since he left it had started snowing and I was afraid he might get stuck in a drift and the C., B. & X. trains would hit him. And I knew what that would mean, with fifty or sixty school-teachers crowded in the passenger-coach he carried.

By a roundabout way through Omaha, Lincoln, and down to Wheatville, I got the operator there. He said the break must be near me, as his line was working east to a station twenty miles from me.

Then I had a happy thought. I called up the local exchange and asked them to get me a farmer near the railroad eight or ten miles out. After half an hour they called:

"We've got Mr. Dobbins. He lives about ten miles out, and almost on the right-of-way. He will talk."

"This is the train-despatcher at Honeyville," I introduced myself. "Has the morning passenger passed your house?"

I heard him asking his family if the train had passed.

"Yes," the voice replied. "The hired hand says it always passes about nine o'clock. He waters his horses just after it passes."

"But are you sure it has passed this morning?" I insisted.

"Yes," the voice answered. "He was in the barn when it went by."

Just as I was hanging up the receiver the voice came over the wire:

"What's wheat worth to-day?"

I made a rough guess, for it was seldom I noticed the market pages of the papers.

"Ninety-eight cents," I replied.

"Gee!" said the voice. "That's just like the robbers. When the weather gets so bad we can't haul grain they raise the price."

I did not stop to argue the question. One of the C., B. & X. trains was due right then, and I chased a caller out after a pilot from among one of our engineers.

There proved to be three sections of the C., B. & X. train. They pulled on to our tracks over the Y, and then the conductors stamped into the office. I was at that moment busy with main-line matters.

"What's your consist?" I asked the conductor of the first train.

"Ten cars Omaha perishable; seven cars coal and nine red-ball merchandise," he replied.

Ten cars perishable! I gasped.

With a blizzard raging perishable was not received for shipment, but this had been started before the cold weather hit. They must go through.

Up the branch for two miles the track was double, and when business necessitated the use of either track for car-storage we used but one track. This day, however, both tracks were clear.

I gave the trains slow orders and clearances.

"You fellows pull up on the right-hand track," I said, "and I'll send the pilots out when they report. You're blocking the yards where you're standing now."

They pulled up, and soon the pilots reported, and I sent them out. After the last one was gone and the trains had pulled out of sight, I was called to the city phone by the office-boy. It was central.

"I have Mr. Smith, who lives five miles out of town," the girl said. "Thought you'd like to talk to him."

"The morning passenger just passed here, backing," said the voice of Smith, "and she was going faster than she ever does. What's the matter?"

My hair rose. Billie, with his coach full of passengers, thinking the road was clear, was backing into the three sections I had sent out!

"Dang a telephone and a farmer's hired hand and everything!" thought I.

Without waiting for the word of the accident I got up to telephone to the doctors and order out the wrecker. As I did so I happened to glance out the window, which looked out on the yards. And there, poking its nose through the snow, not three rail-lengths from the station, was Billie's passenger-coach and the train behind it!

"There's a tree blown over the track about ten miles out," said Billie, "and the cut's full of snow. I'll have to have some men to get it clear. And what are those C., B. & X. trains doing on the right-hand line? One of them hit the derail and he's got his front trucks off."

"Thank God he's hit that derail, Billie!" I said fervently, weak from the reaction. "If he hadn't he'd have hit your coach; and think of those passengers."

"Piffle!" exclaimed Billie. "That old coach isn't worth its weight in kindling-wood. And those passengers! They're the jolliest crowd I've had for a month. They wouldn't come back with me, but have built a big bonfire by the side of the track and are singing rah-rah songs and roasting sweet potatoes they got from a farmer close by. I'll pick 'em up when I go back."

But I was so unnerved I had to call relief. That experience put a silver thread or three among the golden locks of my erstwhile youth.

MT. TAMALPAIS "BOWKNOT,"—

THE DOUBLE BOWKNOT ON MT. TAMALPAIS—IT WINDS IN AND WINDS OUT AND AFTER ALL ONLY GETS YOU NINETY FEET HIGHER.

WORLD'S CROOKEDEST ROAD.

SHAY GEARED ENGINE FOR MOUNTAIN USE—PINIONS FROM THE MAIN-LINE SHAFT MESH IN THE WHEELS OF ENGINE AND TENDER

THE crookedest railroad in the world has eight miles of track, and the longest bit of straightaway is only 413 feet. This road is the Mt. Tamalpais and Muir Woods Railway, which is used by every Pacific coast tourist who wishes to look, all at once, upon the hundred cities and towns that lie in the region of the Golden Gate.

The road takes you half a mile into the air without going on a particularly steep or dangerous grade. The tracks wind gracefully about on the side of the mountain, and the picture shown here of the "double bowknot" gives a better idea of the engineering feat than a thousand mere words could supply. This bowknot is but a very small part of the road, and it serves only to accomplish an elevation of ninety feet.

The locomotives used on this mountain railroad are of the Shay Geared type, the favorite hill-climber. The main line shaft, which is flexible, drives pinions which mesh with bevel wheels attached to the outer face of the truck wheels. Each wheel, whether of engine or tender, is geared so that every wheel is converted into a driving wheel. Uphill or down, the engineer has control of the engine.

This peculiar engine is named for its inventor, a lumberman named Shay, who, disgusted because the ordinary locomotive was not adapted for hauling logs on mountainsides on all kinds of grades in all sorts of weather, patched up an iron monster of his own device which would transmit power to every wheel.

Recently an eight-wheel, twenty-passenger coach, driven by a gas engine, was also put in operation on this line for use during the dull season. This motor coach has four speeds and can run twelve miles an hour.

AUTOS THAT RUN ON RAILS.

Gas-Driven Vehicles Used on Scores of Branch Lines to Handle Local Traffic Which Steam-Engine Finds Unprofitable.

COST 18 CENTS A MILE TO OPERATE.

Motor-Buses 70 Feet Long Can Seat 100 Passengers, and Carry Limited Baggage—Independent of Any Outside Motive-Power Unit—Capable of as High Speed as Any Train—Have Proved a Big Builder of Through Business.

BY C. H. CLAUDY.

THE Automobile Man was trying to sell the Railroad President a car. Figures, facts, talking points, advantages, flowed from his lips in a constant stream. And the President seemed interested.

"When you railroad gentlemen get your mileage costs down more," the Automobile Man ended, "you'll get an increased traffic, just as the automobile has increased its traffic by reducing its mileage costs. I shouldn't be surprised, some day, to see automobiles running on rails instead of engines and cars!"

Autos—Yes, Real Ones—on Rails.

"That's possible because it's a fact," was the smiling answer. "The automobile solved a big problem for the railroads, but hardly an automobile builder knows anything about it!"

"Yes," agreed the Automobile Man. "I suppose it did—baggage transfers and the taxi and—"

"Nonsense!" interrupted the President forcefully. "I'm not talking of the petty economies or the fact that the railroad keeps abreast of the times in using modern inventions to increase the comfort of the traveling public. I'm talking about railroad motor-cars."

"You mean the little gasoline inspection-cars section-men use, I suppose."

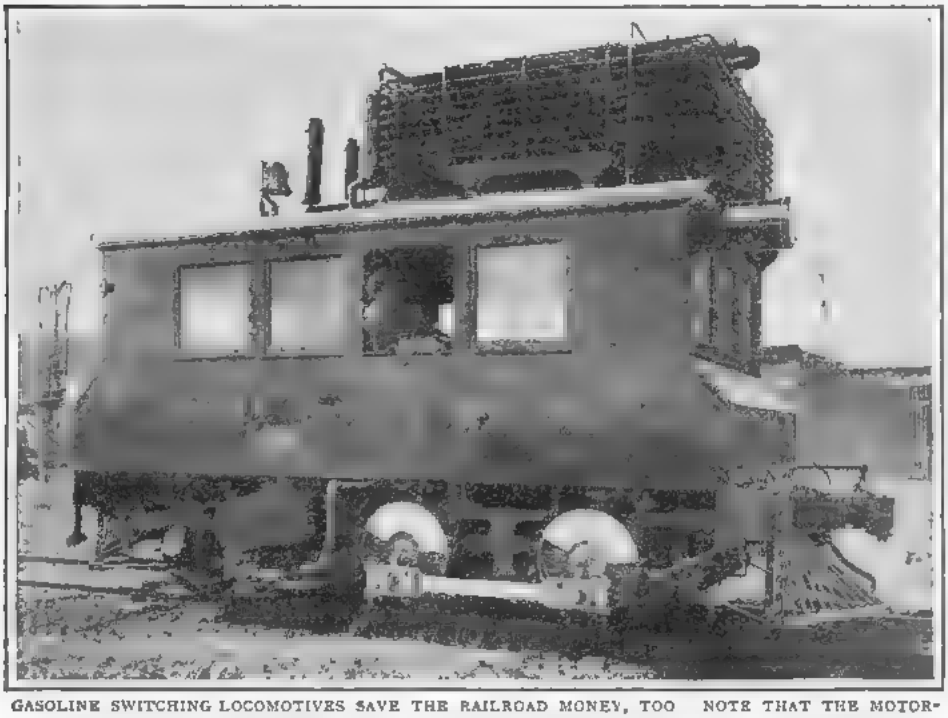
The Automobile Man sat back in the office, satisfied with his outlook and conception of the world of wheels, and sure his cost argument had clinched a sale.

The President snorted.

"I do not," he answered vigorously. "I mean automobiles that run on the rails and carry passengers — self-contained trains of a single unit, that are none the less automobiles that they don't have to be steered. I mean the hundreds of gasoline-mechanical drive and gasoline-electric drive cars that are operating on both main and branch lines in this country and the hundreds more that are paying dividends abroad."

"I never heard of 'em," remarked the Automobile Man as if to say that there-

THE HEAD VEHICLE IS A 300 HORSE-POWER GASOLINE LOCOMOTIVE, AS WELL AS A UNITED STATES RAILWAY POST-OFFICE, AND AN EXPRESS AND BAGGAGE CAR—THIS VERSATILE PIECE OF ROLLING-STOCK IS PULLING A STANDARD RAILROAD COACH FOR PASSENGERS.



GASOLINE SWITCHING LOCOMOTIVES SAVE THE RAILROAD MONEY, TOO NOTE THAT THE MOTORMAN HAS AN UNINTERRUPTED VIEW IN ALL DIRECTIONS, WHILE THE STEAM DONKEY-SKINNER FINDS HIS VISION RESTRICTED BY BOILER AND TENDER

fore then couldn't be very important, "where do they run and what do they do?"

"Where? I'm afraid if I gave you a complete list of the American railways using motor-cars on rails, you'd think I was repeating a list of all American railways from a book. But most of the big roads use them. Pennsylvania, Santa Fe, Union Pacific, Chicago and North Western, Erie, Norfolk and Western—dozens, I might almost say hundreds of roads have found in them the answer to a mighty problem.

"It's this way. Economical through-train operation means large trains and few stops. That's why we run such big through trains. To stop those trains for local traffic is an economic absurdity. Not to stop them means a local train or loss of revenue.

"Local trains cost money. If your local train has a capacity of a hundred passengers and your average is thirty passengers, you are one-third efficient. Then there are branch lines where one train a day won't handle the business, and two or more trains a day lose money. Those are just two instances.

"Along comes the railroad motor-car, with its small operating-expense and its efficiency, and solves both problems for us."

"But what is a railroad motor-car? I never saw one!" protested the Automobile Man, bewildered that his suggestion, made in jest, was apparently a serious matter. "Do you mean a Ford without rubber tires pulling a light hand-car? I saw a picture of such an outfit the other day—"

Car Is a Train in Itself.

"No, I mean a full-sized passenger-car, seventy feet long, capable of seating a hundred passengers, carrying limited baggage, having its own engine-room and power-plant, carrying its own fuel and train-crew, but entirely independent of any outside motive-power unit, able to go as fast as any train, and to operate with a full load at a cost much less per car mile than a regular steam-train.

"Such a car was first developed by the Union Pacific at Omaha—I believe it was in 1901 that the first of them came out, although foreign railroads used some sort of self-contained cars long before that. But I'm talking of American cars.

Central Pacific Was the Pioneer.

"No, it wasn't the first; away back in 1879 the Central Pacific got out a steam unit which seated thirty passengers—engine and tender, baggage and passenger-car were all under one roof. Other roads, both here and abroad, tried the steam motor-car, but without any economy over a regular locomotive and light train. The roof over the whole thing didn't work any special economy."

"But why have *any* self-propelled car? What's the matter with an engine and cars?"

"Economy!" was the terse answer. "We don't try only to handle traffic, but to handle it with a profit. The more traffic, the more profit. The independent unit, operating frequently, stimulates traffic on branch lines.

"You have no idea how great this stimulation is. When Farmer John wants to go to town, twenty miles away, he will be a month arranging matters if he has to get down to the station at seven-two. It's an inconvenient time. He has too many other things to attend to.

"But let him have his choice of seven-two or ten-two or twelve-two or two-fifteen or half past five, and he'll go in a day after the need develops. Don't ask me why—I'm stating a fact.

"I know personally of roads who have had to serve a sparsely settled locality with a mixed train—that is a passenger-car hooked on to a freight—which have substituted the motor-car and doubled their passenger revenue in six months, and lopped a large per cent off freight-train expense. For you can't operate a mixed train with economy for either class

of service. The freight delays the man, and the frequent stops delay the freight, and no one is satisfied."

"Well, all that may be true," agreed the Automobile Man. "But I don't see what license you have to call such a self-contained unit an automobile. An automobile is a self-moving vehicle having a gasoline-engine, a system of transmission by which gears can be interposed between engine and driving-wheels, brakes for stopping, and—"

Only Difference Is in Steering-Gear.

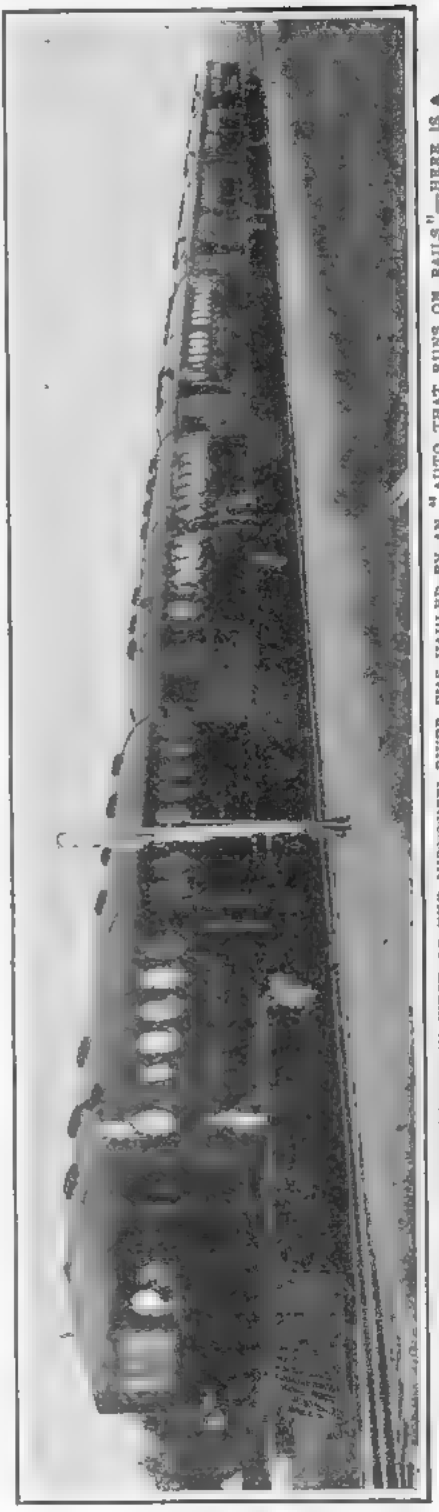
"Well, the gasoline mechanical-drive motor, such as the McKeen car, named after the man who developed it at its best and who now makes it, has all those things. Yes, certainly those cars have high and low gear and a shaft lever and a clutch. How could you get any power out of a gasoline-engine at the start or on grades if you hadn't?

"They use compressed air to operate the lever and clutch, of course, because those gears are pretty heavy, and it wouldn't do to slip into neutral while trying to shift. But in everything but the stearing-gear the gasoline-mechanical drive car is an automobile on rails.

"It has all the automobile's flexibility. It can pass a train or another motor on a siding in the minimum of time. It can be reversed on a turntable as easily as a locomotive. An engineer, a conductor, and one man for a crew can operate one easily, whereas a crew of five or more are needed for the smallest steam-train.

"And the up-keep and repairs, somewhat unlike the street automobile"—and the President smiled grimly—"are very much less than the upkeep of the most modest steam-train. Altogether, railroads have found the gasoline-mechanical drive automobile a great success."

"You keep saying 'gasoline-mechanical,'" said the Automobile Man, properly crushed because of the reference to the upkeep expense of street motor-cars, and anxious to turn the subject. "What other kind is there?"



THE FIRST ALL-STEEL PASSENGER-TRAIN WEST OF THE MISSISSIPPI RIVER WAS HAULED BY AN "AUTO THAT RUNS ON RAILS."—HERE IS A PICTURE OF IT, TAKEN AT DUNCAN, NEBRASKA.

"Oh, they make motor-cars for railroads on a whole lot of systems," was the immediate assurance — "steam, compressed air, storage-battery, steam-electric, gasoline-mechanical, and gasoline-electric. They have tried super-heated water and liquid air, but these didn't work out very well. Nowadays there are only three kinds worth considering—gasoline-mechanical, gasoline-electric, and storage-battery.

This Kind Carries Its Own Power-House.

"The gasoline-electric car is a trolley-car carrying its own power-house with it. It has a gas-engine power-plant generating electricity and motors to turn the current into power. It is growing in popularity in spite of the fact that it has to turn the energy in gasoline into mechanical power, the mechanical power into electricity, and the electric power back into mechanical power again.

"In the beginning this was horribly uneconomical. The first gasoline-electric car made in this country appeared in 1890 and weighed eleven tons. To-day a fifty-ton outfit is average. The first one had an eighteen horse-power engine and a twelve kilowatt generator, a storage-battery to help the generator out, and a thirty-five horse-power motor!

"That outfit was not economical. But in spite of the fact that the gasoline-electric car has three changes of power—gas to motion, motion to electricity, electricity to motion—and the gasoline-mechanical only one, the gas-electric compares on even terms with the mechanical in point of costs.

"The Southern has a couple of these cars, the 'Frisco lines almost twenty, and Rock Island, Great Northern, the C. M. and T., Pittsburgh and Lake Erie, Texas Midland, and a whole lot of other roads have given them exhaustive trials and —come back for more."

"I don't doubt your statement," said the Automobile Man, "but I wish you'd explain. Now, in automobiles—road automobiles, you understand—such a scheme would be wickedly expensive. Even the storage-battery cars are expensive to run compared to gas-cars because they use power which comes from coal, converted into electricity, which, in charging the battery, is reconverted into chemical action which, in coming out of battery, is again turned into electricity, and finally reconverted into mechanical power. How a car on a railroad can make this economical—"

"Does seem odd," agreed the President. "But here is the reason why the electric unit, driven from power it generates from gas, can compete with the direct gas. It has a superior control. It is more reliable, and—it costs less to maintain.

"You see, in a gasoline-electric unit the engine is running full speed all the time, regardless of the car's speed. You don't have to be told that a gasoline-engine has one best speed, one most economical speed.

"Again, the electric-car drives through two or more axles—better tractive effort on grades or slippery rails. If the brakes fail, the motors can be used to stop the car. Speed-changes are made without shocks. There is no clutch, no gears to change, and so no upkeep on these parts of the mechanism.

Figuring the Odds in Pennies.

"But the real answer is in pennies. Gasoline-cars and gasoline-electric cars run very close together in costs per mile of operation. The average on the gasoline-mechanical drive is about eighteen cents, and about sixteen for the gasoline-electric, not to mention the increased smoothness of start and stop and the greater efficiency on grades and for extra heavy hauling of the electric.

"For the capacity of the gasoline-drive car is absolutely fixed by its low gear and efficient engine speed. On the electric-car the only limit to the ability to 'crawl out of a hole' is the power of the electric apparatus to resist burning up. And while you may not know it,

the modern electric motor as applied to heavy duty work on railroads is about the most ragged piece of apparatus made."

"Does the economy hold up in storage-battery cars?" asked the Automobile Man, his ideas rapidly undergoing a change.

Storage-Battery Outfit for Cold Climates.

"I haven't figures at hand that prove anything. But I know of one case where a storage-battery car does things no other type of motive power can do," answered the President, "and there are many others.

"The instance I speak of is the Tanana Valley Railroad. Never heard of it? Well, it runs in Alaska, with a terminal at Fairbanks

"A gasoline outfit is almost impossible there on account of the constant danger of freezing the water in the radiator. The steam-train costs are high because of the difficulty of firing an engine economically with temperatures down to absolute zero—or somewhere near it.

"But the storage-battery car works out well for short runs. It has a capacity of about a hundred miles, and, like the Great Northern storage-battery car, is equipped with a regular locomotive air-brake equipment.

"Then there are compressed-air cars and superheated steam-cars and—"

"Yes, I know. So you said," interrupted the Automobile Man. "But I am not half so much interested in the kinds that haven't made good as I am in the 'why' for the kinds that have."

"They are successful in taking the place of steam-trains in certain cases,"

THIS QUEER-LOOKING SPEEDER, DRIVEN BY A GASOLINE MOTOR, IS USED BY THE AUSTRIAN GENERAL STAFF IN GALICIA IT HAS PROVED VALUABLE FOR INSPECTION AND SCOUTING PURPOSES.

From a photograph by Paul Thomŋson, New York

was the immediate answer, "because they cost little to buy and little to run. That makes them available for the establishment of frequent schedules on branch lines where a light traffic with numerous stops kills off the profits on a steam-train.

Makes Business for the Through Train.

"The automobile-car for the railroad is like a trolley-car. Every one knows the steam-roads at first fought the trolley extension. Now steam-roads build, own, and operate trolleys as fast as they can. Why? Because the short haul, the frequent stop, and the fast schedules required even for slender local traffic are the least profitable for a road. But the trolley makes a profit out of what was an expense to the railroad. *And it brings the passenger to the terminus for the longer haul.*

"So does the self-contained unit for the railroad. I know one case where the management had been stopping a heavy through express to pick up local traffic because of the expense of putting on a local train and the sure knowledge that it wouldn't pay that expense. Now, stopping a through expense for local traffic is about as idiotic a way of running a road as it would be to try to run a locomotive with alkali water to avoid the expense of putting in a water-purifier. In a little while there wouldn't be any locomotive left.

"And this constant stopping of a through express was slowly but surely putting the express out of business. Passengers on the through wouldn't stand for the loss of time. So the road put on a self-contained unit—a gasoline-direct it was—and ran it for thirty miles, forty minutes ahead of the express at the start, to get in ten minutes ahead of her at the terminus. It picked up all the local traffic, and had it ready for the through express at the terminus.

"All they asked of the self-mover was to pay expenses. She tripled the local traffic on that main line in a year, and made the local steamer they put on a paying possibility.

"One of the reasons why the self-contained car does with economy what the steam-train cannot do is the matter of weight per passenger. In a fifty-ton motor-car carrying a hundred passengers, the weight per passenger is half a ton—a thousand pounds. In some lighter railroad automobiles this has been reduced to four hundred pounds per passenger, as little as in your road automobile.

"But in a heavy steam-train, even if fully loaded, there will be a dead load of a ton and a half per passenger in the Pullmans alone, not counting the locomotive. Now, the less dead weight you have to haul, the more money per pound you take in.

"Another reason for the success of the motor-car in displacing steam-trains on certain lines is that it has turned a 'sore' public into one which boosts for the road. Only a traffic man knows what the difference may be in dividends. Railroads deal in figures and facts, but the psychology of having a crowd with you instead of against you works out into very exact figures.

"Take the case of a road which is operating one steam-train local on a branch line at a loss. The public on that branch line is kicking like a steer. They want two trains; indeed, if they don't present a petition a month demanding half a dozen, the president can consider himself lucky. Yet he knows that as his first and only local train is losing money, a second will be a dead loss, or almost dead.

How It Creates Friends for the Company.

"Now, suppose he puts on a self-contained unit. He makes an initial investment of from five to twenty thousand dollars, depending on type and kind of outfit he buys. He starts his second daily service with the assurance that instead of paying from twenty-five to thirty-five cents per train-mile for a new steam-train, he is going to run the second ser-

vice at a cost of from fifteen to eighteen cents per train-mile. The difference ought to, and probably does, pay the deficit on the steam-train that is losing, the second service satisfies the local traffic and makes it contented, and—here is the interesting part—that contentment, or perhaps the greater convenience of the second service, so develops traffic on that branch that inside of a year or two the whole branch is paying a good profit! The self-mover can then be taken off and a steam-train of greater hauling capacity substituted, or another automobile can be put on."

Mr. Interlocutor Is Skeptical.

"Are you sure about your figures?" inquired the Automobile Man doubtfully. "It seems to me they are absurdly low. Fifteen to eighteen cents per mile to run a fifty-ton car; why, a *road* automobile won't compare, weight for weight, with that! A fiftieth of eighteen cents would make a one-ton automobile operate for three-tenths of a cent a mile. Your figures must be wrong."

"Well, they may be," smiled the President. "But I got them on pretty good authority. There are eleven roads using one type of railroad motor, and the manufacturers took the trouble to get the figures and calculate an average. The Chicago, Milwaukee and St. Paul; Quanah, Acme and Pacific; Missouri and North Arkansas; Chicago, Peoria and St. Louis; Midland Valley; Santa Fe; New Orleans; Great Northern; St. Louis and San Francisco; New Iberia and Northern; Rock Island; and St. Louis and Southwestern all turned in reports covering forty-three different gasoline-mechanical drive automobile cars, which had run a total of 752,965 miles.

"The total average operating-costs, which included fuel, lubrication, repairs, labor and material; wages, including engineer, conductor, porter, brakeman and trainman; cleaning, ice, coal, and miscellaneous supples, was eighteen and sixty-nine hundredths cents per train-mile.

"And there are less elaborate figures right here on my desk"—and the President hunted out a pamphlet—"showing that with six gasoline-electric self-movers operating on the Frisco lines for a total of 181,438 miles, the costs, including the same main headings of fuel, lubrication, labor, cleaning, supplies repairs, and miscellaneous, was sixteen and sixty-one hundredths of a cent per mile."

"I take it all back," said the Automobile Man. "But why have you all this on your desk?"

"Because I have two branch lines that don't pay, and these are the reports that are going to make them pay," was the answer. "If the roads I have quoted to you can do it, I can do it. And when *you* get your operating-costs down as low as *we* can get them"—and the President smiled pleasantly—"I'll consider buying one of *your* kind of cars for personal use."

The Automobile Man found himself outside.

"Good night!" he ejaculated. "Three-tenths of a cent a mile, a hundred passengers, and gas going up, up, up. Maybe those railroad engineers could teach the factory something, after all!"

THE SUPER OF THE HILL DIVISION SAYS:

YOU'VE got to stand for a lot of rough going if you want to get to the top.

FROM THE RAILROAD MAN'S MAGAZINE.

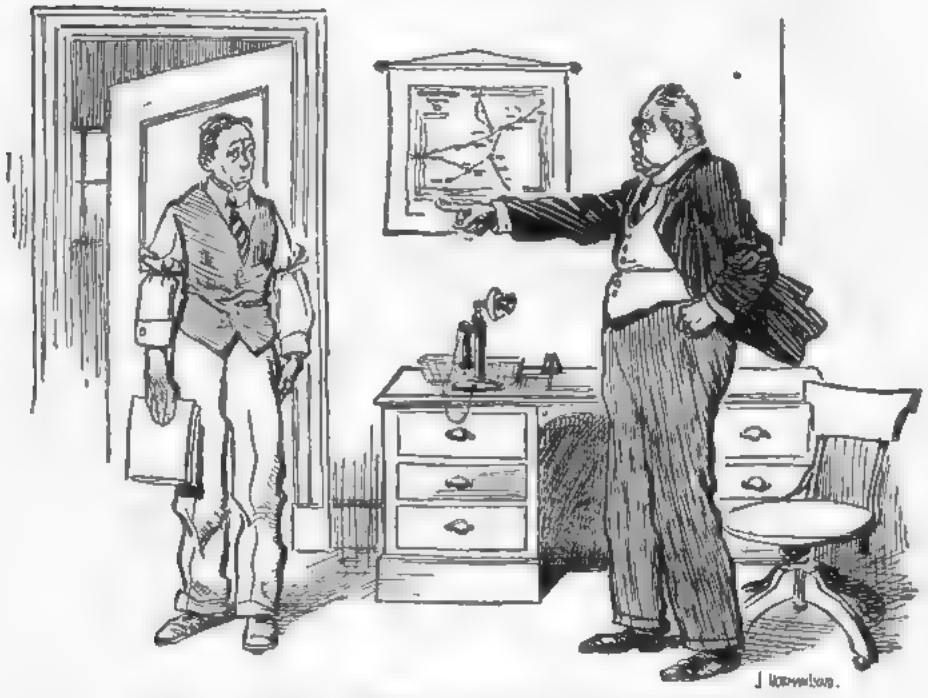
WORLD'S GREATEST PIERS SUPPORT THIS BRIDGE.

THE TWO GREAT PIERS WHICH ARE THE MOST PROMINENT FEATURES OF THIS BRIDGE MEASURE NINETY-TWO AND ONE-THIRD METERS—ALMOST 300 FEET—FROM FOUNDATION-PLATFORM TO TOP, THUS FAR EXCEEDING IN HEIGHT ANY OTHER LIKE PEDIMENTS OF MASONRY THE BRIDGE ITSELF IS THE VIADUCT DES FADES, IT SPANS THE VALLEY OF THE SIOUILE, AND FORMS PART OF THE RAILROAD ROUTE FROM ST ELOY TO PAUNIAT, IN THE DEPARTMENT OF PUY-DE-DOME FROM THE WATER TO THE TOP RAIL THE DISTANCE IS 132½ METERS—OVER 400 FEET THE MIDDLE TRUSS IS 144 METERS—ABOUT 450 FEET—LONG, AND THE SIDE TRUSSES MEASURE 116 METERS—MORE THAN 350 FEET

OBSERVATIONS OF A COUNTRY STATION-AGENT.

BY J. E. SMITH.

If It Weren't for a Lot of Laughs, This Would Be Almost Like a Sermon, with Text and Moral.



WHEN HE BECOMES EXCITED HIS NECK TAKES ON ITS FIERIEST TINT

IN structure this article is something like a sermon. I am taking as my text—

Nicknames.

In that good, old orthodox fashion I shall proceed with these subdivisions·

Why is Section Foreman Casey called "Old Per Cent"?

Why is Crossing Watchman Dan Banks called "Lucy"?

Why is Conductor Davis called "Dead-Shot"?

Why is Brakeman Brown called "Brace Up Brown"?

Take the matter of nicknames in general. It is often the case that a man will go through life with some odd appellative attached to him, to which he answers.

When a man is called Bill we know his real name is William. When we run across Dick we know the legal christening was Richard

Why Bill for William?

Why Dick for Richard?

There was a start somewhere for these changes of forms, and there are reasons. How many of us stop to investigate why these things are when they are not?

DAUGHERTY HAD A TWENTY PER CENT INCREASE

I confess that in these hurry-scurry days of the upward and onward price movement of bacon and gasoline there are left but few brief moments for idle speculations. The conundrum business is only for the idle. But I feel the impulse to stop long enough to ask, Why are so many men nicknamed who work on railroads?

That is not so easily answered as the more commonplace conundrums of railroads and railroaders.

If I had asked, "At what time has a train the least chance of starting?" you would answer instanter—off the bat "12.50, because that is a ten to one shot."

If I had asked, "Why does a conductor punch a hole in your ticket?" you would answer, "To let me pass through."

If I ask, "Why is a railroad track a particularly sentimental object?" you would come back with the same alacrity, "Because it is bound by close ties."

Or once again, "Why is a young lady like a locomotive?" Quick answer: "Because she transports the males, scatters the sparks, carries a train, puffs, and passes over the plains."

But when I ask, "Why so many nicknames among railroad workers?" there is no answer.

A nickname is sometimes bestowed in derision, or from sportive familiarity.

More often it comes from some particular incident having a simple jest or a more complicated joke as a basis. Within the brief space of a single hour a man may acquire a name that will last a lifetime.

I knew a superintendent at one time who was regularly known as "Red-Neck." It is not a particularly flossy name. It never appears in the official announcements, nor shall we ever see it in any published notices of his personal activities, nor will it intrude in his biography.

This superintendent has a florid face and the hue deepens from the ears downward. When he becomes in earnest or excited or under any emotion whatsoever, his neck takes on its fieriest tint. In this

way he has become "Old Red-Neck." The name was not bestowed in derision or contempt. It became commonplace and was used without intent of any reflection or disrespect.

An engineer is known as "eagle-eye." A poor telegraph operator is known as a "ham." A beginner is a "plug." An old engine is a "tub." The neat little bungalow house of a crossing watchman is a "shanty." The pay-car is "the ghost that walks."

From the days of the Camden and Amboy Railroad the higher officials have been known as "brass collars." The fellow that shovels gravel and tamps ties is a "Hun-Yok." The wreck-train is the "big hook." Oil and waste lubrication is "dope."

Sleep is known as the "hay." Food is "fodder." Any one stealing a ride is a "bo." There is no end.

Nor are we particularly interested in the number or varieties of these handy misnomers. I confess to some curiosity to know how they all came into use. Who originated them? Why and how?

I found it an interesting diversion taking the clues from a number of nicknames to which no one gave further thought, and running them down to their sources.

First we shall consider Foreman Casey of Section 27, nicknamed "Per Cent."

Foreman Casey's full name is P. T. Casey. The "P" does not stand for Per Cent, but for Patrick. There is no conceivable turn of alliteration or nimble tongue-twisting that readily remolds Patrick into Per Cent.

The initial "P" was not responsible. The "P" could have been Peter, Paul, Plato, Pliny or Pythagoras aside from Patrick. But not in a thousand years would a child be named Per Cent.

Roll that awkward combination on your tongue for an instant.

"Per Cent Timothy Casey."

To sound well there must be a certain jump and meter to names. They must ripple off with a pleasing jingle and rhythm.

"Patrick Timothy Casey" rolls out like the "Anvil Chorus." Now try "Per Cent Timothy Casey." It goes like one leg and no crutch. It is in the class of "she sells sea-shells," "truly rural," "Theophilus Thistle the thistle-sifter," etc.

I asked some of the section hands why Casey was called Per Cent. They did not know.

"I've always heard 'im called that," replied one. "I s'pose that's the reason."

But that is not the reason.

Some one used the word for the first time. There was a "why" for it. It may have been some trivial circumstance.

I asked Casey.

He replied with a grin, evasive, but final so far as any definite information was concerned.

"Per Cent? Why, that's the name they've had for me for ten years or more. It is because Section 27 is twenty per cent better 'an any other section on the division. It is because the foreman of Section 27 has twenty per cent more skill and knowledge of track than any other section foreman on the road. It is a name of honor, like colonel or gineral."

That is as far as I got.

The old crossing watchman at Main Street Crossing was for many years a hand under Casey. His name is Daniel Banks. They call him "Lucy." That, I take it, is because it sounds so much like Dan. Any one should see that—Lucy, short for Dan.

"Daniel," I asked, "why does every one call you Lucy? By what imaginable hook or crook can Daniel be converted into Lucy for ready every-day use?"

Daniel squinted hard at me a moment and replied:

"It's all ding foolishness. They ain't no reason. Casey done it. He started it. First year I was here on this crossin' job I—I—"

Daniel hesitated and lit his pipe. The pause was fatal to the story.

"Well, Casey just called me Lucy and it stuck. That's all there is to it—he

called me Lucy and it stuck. Now I reckon I'll go by that name all the rest of my days."

Daniel, *alias* Lucy, removed the pipe from his mouth, held it suspended, and eyed me with unspoken umbrage for having mentioned it.

"Is that all?" I asked.

"That's all."

"You did not tell me why Casey applied the name Lucy. Why not Maggie or Jennie or Josephine?"

"Why, *her* name was Lucy, you know," explained Dan.

"So," I came back with interest, "there was a woman in the case and her name was Lucy. I see, I see! A woman named Lucy. That accounts for it. And so Casey gave her name to you. That's interesting. How was it?"

"Nothin', nothin' at all," replied Daniel slowly. "You see, he wanted to get back at me for calling him Per Cent. So just because of a little happening he called me Lucy, and it stuck. When I named him Per Cent it stuck too, by criminy. Casey was just a gittin' even with me on this Lucy business, that's all."

I saw my opening and made a quick switch of the conversation.

"How did Casey come to get the nickname Per Cent?" I asked.

"Me. I give it to 'im," replied Daniel proudly, as though he had bestowed the greatest of all blessings on his friend. "It was all a joke. It was this way."

Then Daniel, or Lucy, told me this storiette on Casey as the origin of Casey's nickname Per Cent:

Tim Casey, foreman of Section 27, was good and sore.

He was out on the work-train with his gang, and Hooley, who had charge of the work, asked him if he had heard about it?

"No. What?" asked Tim.

"About Daugherty."

"An' what about Daugherty?"

"Got an increase yesterday."

"How much?" asked Tim savagely.

"Twenty per cent, I think," replied Hooley.

"Twenty per cent!" fairly howled Casey. "An' what's Daugherty got? Not a switch on his section. Not wan! While they's four miles and six sidings on Section 27. A raise of twenty per cent—twenty per cent!—an' he was already gittin' sixty, and me sixty."

Hooley was called away, but Foreman Casey, stirred by a great injustice, commented further:

"There's nawthin' fair about it—nawthin' at all! Daugherty's got the easiest section on the road, and mine's the hardest of 'em all to keep up."

(Every section foreman tells that his section is the most difficult of them all to maintain.)

"It's pull that done it. Daugherty's got a pull."

When Tim Casey got in he wrote a letter of protest. He demanded that if any increases were being passed around to section foremen, Section 27 should not be overlooked.

Why should Daugherty on Section 25 get a twenty per cent increase while Casey on Section 27 gets no increase? Was it fair? Why was it, anyway?

Was not Casey as deserving as any section foreman on the road? Wasn't Section 27 in tiptop shape? If there was to be one per cent, ten per cent, or twenty per cent, Casey was the one who should have it.

Casey paused and read over what he had written. It was weak and insipid. It lacked the punch. So he ground his teeth firmly together and added this paragraph:

> I am wantin' the same per-cent increase that Daugherty gets. If I don't get the same—I quit

Casey held it well out with a firm hand, and read it silently. Then for emphasis he read it aloud to the hands, putting a hard, oratorical impressiveness on the concluding sentence, and with a loud explosive finality on the two words, "I quit!"

Roadmaster Slagle read the communication and was mystified. He knew of no

salary increase to Daugherty of Section 25, or to any other section foreman. So he called Hooley.

"I say, Hooley," he asked, "what is this bunk you've passed to Casey about Daugherty of Section 25 gettin' a twenty per cent increase?"

"It ain't bunk," replied Hooley.

"Daugherty ain't had any raise," protested Slagle

"Who said he had?"

"Casey writes in you informed him so."

"Nawthin' to it," protested Hooley. "I said a twenty per cent increase. I didn't say a raise, or a boost, or advance, or pile-up, or spread. I only said to Casey:

"'Did you hear about Daugherty? He's had an increase?'

"'How much?' asks Casey.

"'About twenty per cent,' says I.

"And that's all there is to it."

"And ain't that enough, since there's nawthin' at all to it?" asked Slagle.

Hooley whispered a few words to Slagle in further explanation. Slagle gave a concurring nod and a chuckle. Then he answered Casey's letter and told him not to resign, for he was entitled to as many good things as Daugherty. And to go to it and good luck to him.

"That was the answer Casey got," continued the old crossing watchman, who was narrating the incident to me. "All they was to it was that Daugherty had twins at his house. Since he already had eight, two more made what Hooley called a twenty per cent increase. That was what Tim Casey worked himself all up to the quitting-point about. After that I just called him Per Cent; so did all the other hands, and it stuck."

"Then old Per Cent got even with you by calling you Lucy," I encouraged.

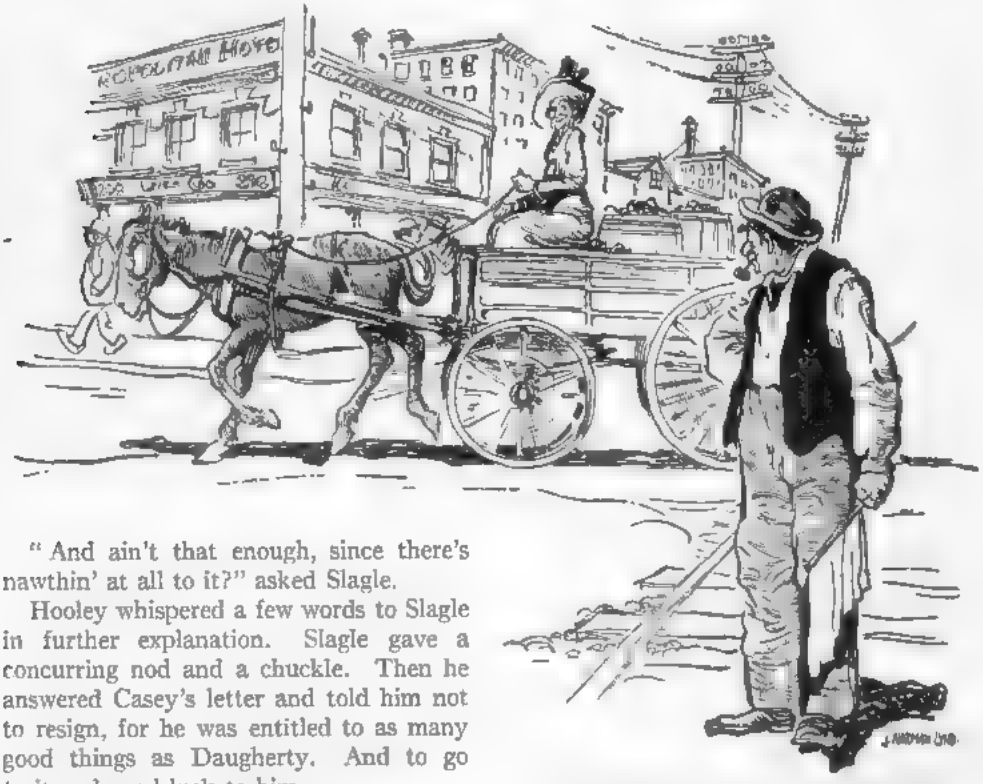
"We had two specials over the road yesterday," adroitly observed Lucy.

"Why did he nickname you Lucy?"

"One was the general manager's and t'other was a theater party goin' to Pittsburgh."

"But Casey—I mean old Per Cent—"

"They's to be two show-trains over to-morrow; the Great Spread-Eagle Circus—"



DAN SPIED HER WHEN SHE DROVE OVER THE CROSSING.

That was as far in the "Lucy" direction I got. But I had learned why Tim Casey was called Per Cent. Maybe Tim Casey could tell me how Daniel became Lucy.

"Sure," said Casey, "there's a reason. Daniel Banks was a good hand, but he got too old for Section 27, so they made him crossing watchman at the Main Street crossing. He was a widower at the time and an old fool at that. Seems like it just naturally runs that way.

"Down toward the river was a large, hefty, raw-boned female named Lucy. She had a good truck-patch, six pigs and two cows. Dan spied her when she drove over the crossing the first day with a load of onions and radishes. He scented the spread of prosperity, and in less than a week he married her.

"They didn't hold hands and loiter along the bowery pathways planning and dreaming. Dan nailed her just as she laid out to grab Dan.

"'She's got some property,' says Dan to me, 'and she's a good worker.'"

Divesting the story of Casey's particular vernacular, let us wait some ten minutes for the mists of romantic fancies to arise and dissolve from the scene of the ceremony. Two facts stand out like the coal-shed in a fog:

Daniel married for material advantage.

Lucy wanted help with the cows.

Lucy had no love-lorn hallucinations that befogged her vision in any way. The first thing she did was to take an inventory of what she had drawn

Dan's job was Appraisal Number One. She said watching a crossing was not a man's work. She expressed herself with a certain positiveness and finality as if she were merely quoting an axiom or a self-evident truth. Furthermore, Lucy was strong and masterful, and Dan had worked under a boss all his life.

"What you need," said Lucy, "is hard work and plenty of it to keep you goin' right."

Be it understood that Lucy had been married two or three times before, and there were none of those sublimated notions or empyrean conceits about her in connection with the marital state. Her feet were firmly on the ground, where there were thorns and stones.

"To-morrow you are goin' to stay right here and bug potatoes all day," continued Lucy, laying out the program.

"I'll be fired," expostulated Dan. "I got to watch the crossing."

"That's nothin' but a lazy loafer job," retorted Lucy. "I need some rest myself. I'm goin' up in the mornin' and do that myself. You are to bug the potatoes."

"You don't know how to watch a crossin'."

"I don't know how!" Lucy repeated with an attitude of assumption and authority. "Don't know how! Huh! Watch me!"

As I said before, Dan had always been under a boss, so on the following day in the shifting events of his life, and under the new conditions, he bugged potatoes, while Lucy, in her best gingham gown and sunbonnet, stood with a white flag and watched the traffic of the street over the rails as it had never been watched before.

Toward evening Casey came pumping in on his hand-car, and Lucy brought him to a dead stop to let a load of coal and a milk-wagon across ahead of him.

Section Foreman Casey took violent exceptions to this plan of operations. He wanted to know of the female Amazon who told her she could keep Dan at home raising carrots while she watched the crossing?

The keeper of the white flag made hot personal retort to the general effect of, "Who owned Dan anyway, and why should Casey nib in when it was none of his business?"

But it was Casey's business. For at once he visited Dan and he made it plain to Dan and Lucy that Dan must forsake the ubiquitous potato-bug and the patch of orange-red and spindle-shaped carrots, or to-morrow morning there would be

HIS ROOM WAS INVADED, AND HE WAS THE ONE BRAVE MAN AND CERTAIN SHOT

another watchman on the Main Street crossing.

Next day Dan, the benedict, was back on his old job, and somehow, from the long, hard day before, everything that approached the crossing, whether a red automobile or a load of hay, took on the shape of a large, fat potato-bug waddling, tumbling, running or flying toward him.

" Old Per Cent has always been a good friend of mine," observed Dan, who was born to be bossed.

But " old Per Cent," otherwise Casey, never again called Dan anything other than Lucy.

So one is Per Cent and the other is Lucy, and all who know them speak to them and of them by these nicknames. Only a few of us know the incidents. Wherefore among ourselves this is told in confidence and is not to be repeated

Next in order we shall take up the case of Conductor " Dead-Shot " Davis

How came he to be called Dead Shot? We found this:

Davis joined a gun club. He gave promise of being a good shot. He practised with both gun and pistol and made some creditable scores.

Davis had a good room at a railroad boarding-house where he kept his armament.

About the time he was most interested in small arms and fine shooting, a number of petty burglaries occurred in the neighborhood where he was located. Finally his rooming-house was entered by the light-fingered marauder.

In the little circle interested it caused vast excitement. All the frightened weaklings of the household naturally looked to Davis for protection, as he had both the latest type of gun and revolver in his room, and was a member of the gun club and a crack shot.

Davis rather enjoyed the pose of heroic defender, and boasted that nothing would please him so well as to wing a sneak-thief. Just give him a chance at the prowling freebooter. He saw that all his artillery

was in good shape and in easy reach, so that in the darkness he could place a ready hand on it.

Davis's bed was so located that any moving figure would dimly silhouette against the outside light of the window beyond the footboard of the bed.

It was very dark in the room. He was not quite sure he had heard any strange noise, but he had a telepathic hunch that some one was there.

His heart pounded away in panic mockery of all premeditated coolness. He slipped a nervous finger onto the

THE OLD JANITOR ALMOST WHISPERED THE SECRET TO HIM.

We all have our stages and degrees of burglary expectation. We now and then work ourselves up to a high degree of preparedness as to just what and how we would perform in the crucial moment.

Davis's plan of action was well thought out.

He hung his pantaloons directly in front of the window. A burglar exploiting the room would thus halt in dim visible outline. Then Davis could line him.

Bing! Bang! Boom!

Call the coroner!

Davis thought this all out too intensively. It got on his nerves. Something awoke him.

trigger of his sure shooter. He strained an eye over the footboard of the bed. He detected a stealthy movement between him and the window.

Some one was in the room! The some one had found the pantaloons. He was not standing upright. Only a small portion of his figure showed above the footboard of the bed.

Davis was bound to fire. His room was invaded, and he was the one brave man and certain shot. Only by winging the burglar could he sustain his reputation. To let him escape would be a disgrace.

He drew the finest bead. Once more:

Bing! Bang! Boom! More business for the coroner.

A tremendous uproar followed. There was a discordant chorus of screams, shrieks, and shouts, in which an awful yelp from Davis himself intruded like a frog accompaniment to a flock of katydids. The inmates rushed in wild panic, at first everywhere and nowhere, but at last converging at Davis's room.

Davis had shot off his big toe.

There was no other sign of disturbance in the room.

The pantaloons hung undisturbed under the window, exactly where the wearer had placed them the night before. The window-screen was intact. The door was locked. The transom was closed. In short, nothing at all had been disturbed.

While neither Sherlock Holmes nor Detective Burns lent any help in the solution of the mystery, it came out in the final washing that Davis in some manner got his foot on the end board of the bed, that he saw it move, and to justify all that was expected of him as the bulwark of defense in the house, he took no chances but winged the unoffending member with a reckless celerity.

What's one toe, anyway? Many a corn-indented sufferer would be glad to lose all ten of them.

Anyway, from that moment it became Dead-Shot Davis, and the name stuck.

As our last and final exhibit, dear brothers and sisters, we have Brakeman "Brace Up" Brown

Brown is no mean sort of a member of the Order of Railroad Trainmen, but the first time he applied for a place as brakeman he did not get on.

The strange thing at that time that Brown could not understand was that the road was wanting brakemen, and hired two other new men the same day after they turned him down.

He would never have known, had he not in a kindly spirit given the old colored janitor a cigar and stopped long enough to exchange a pleasant word with him.

The manner of Brown's application was this:

He presented himself at the trainmaster's office. That official bestowed one look at him and requested him to step out and return after a bit.

Brown did this, and after a reasonable time came back. The trainmaster then gave him Look Number Two, and without further ceremony bluntly informed him he could not use him.

It puzzled Brown to know why. A little later he again ran across the old janitor, and he found that the cigar and the greetings he had bestowed on him had enlisted the old man's interest.

"Good even', good even'," said the old janitor warmly. "So yo' didn't get on. Dat's sho' bad. If yo' kin come back nex' week and do as I says, maybe yo' have better luck."

Brown did come back on this hint, and the old janitor almost whispered the secret to him.

"Yo' all want to brace up, Mr. Brown. W'en you went in befo' you didn't stood up, Mr. Brown. You leaned ag'in' the wall. They tol' you to go out and come in ag'in. When yo' done that yo' leaned ag'in' t'other wall.

"The railroad don' hire no leaners, Mr. Brown. When a young man don' stand up straight befo' the trainmaster he turns 'im down. Allers turns 'im down, Mr. Brown. They don' hire no leaners."

Brown acted on this hint.

He went in, stood very erect, looked every one squarely in the eyes, and was taken on without a word

The old janitor was delighted.

"I tol' yo', Mr. Brown, don' ever be a leaner," he said. "Yo' allers want to brace up—brace up, Mr. Brown!"

Thus ever after we have had with us—

Brace Up Brown.

Now, having started out with a text and sub-divisions like a discourse on theology, this ending paragraph in all fitness must carry a moral, a lesson, an abiding thought—

Don' be a leaner.

WHAT A R. R. TICKET COVERS.

COURTESY, courtesy, and again courtesy! That is the keynote of modern railroad service. To day it is rare indeed that a railroad man is brusk to any patron of the line; and when he is you will usually find he has been goaded beyond endurance. Courtesy benefits a railroad—or anybody else for that matter—in both a financial and a moral way. In a financial way, because the public would rather trade with a pleasant person than with a grouch. "You can catch more flies with molasses than you can with vinegar." In a moral way, because a courteous person is a thoughtful person. Thoughtfulness of the rights and comfort of others is the basis of the Golden Rule, and the Golden Rule in turn is at the foundation of the highest code of conduct.

Mr. Elliott, President of the New Haven, on Good Transportation Service.

Among the systems whose employees are setting an example in civility to the traveling public is the New Haven. The gratifying results it has obtained in this direction are in a large measure due to the issuance of such placards as the following, the author of which is Howard Elliott, Chairman of the Board and President.

A railroad sells transportation, but it sells something else along with it. It sells "service." The price of a railroad ticket covers both. Transportation means the same thing on all railroads. *Service* may mean a very different thing on one railroad from what is does on another.

Service means all the comforts which the equipment furnished provides. It also means the kind of treatment accorded the patron of the railroad while he makes use of this equipment. Respectful, courteous, and painstaking attention to his comfort on the part of agents, conductors, brakemen, and porters—this is one of the most important elements of good service.

A railroad that has a reputation for good service has an asset of incalculable value. It is service which brings patronage to the railroad. It is service which keeps business once it has been obtained by the railroad's solicitors. Any inattention toward the railroad patron by the railroad employee, any discourtesy, any display of bad temper, or an unwillingness to please or to be accommodating is a partial breakdown of railroad service.

Railroad service begins at the ticket office when the railroad patron buys his ticket. It ends at the station where he alights. Between these two points should stretch the railroad smile. It helps business.

First impressions count for much in life. That is why a smile at the ticket-office window and a display of affability, courtesy, and willingness to answer questions and give information on the part of the agent is essential to good railroad service. It creates in the mind of the railroad patron a pleasant picture of the railroad.

And this picture is likely to be retained and embellished if later the patron of the railroad is helped on the train by the brakeman or conductor, if he finds his comfort looked out for, his inquiries answered pleasantly, his ticket asked for with a smile, and assistance offered when he alights. All this means service.

Good service depends not only upon what you do, but upon the way you do it. That is true whether you be a clerk in a drug-store or a brakeman on a railroad. Smiles are remembered just as well as frowns. The one helps to make service good; the other helps to make it bad.

A smile is like putting money out at interest. A frown is worse than a bad debt. The public prefers that railroad whose service, from the ticket window to the terminus of the journey, is made of smiles, kind words, and thoughtful acts.

THE COMEDY IN THE SLEEPER.

BY WILLIAM H. SEYMOUR.

Here's Red, the Wisest Guy in the Armor-Plate Show, Falling for the "Turbin of Inwisibility" Gyp!

ED an' me has a good grift with our juice privilege. They is only a ten-case nut on th' joint when we opens up ev'ry mornin', an' we has that ten off before th' big show starts. Th' rest is nearly all velvet, an' me an' him cuts it fifty-fifty.

But Red is one of them guys that can't stand prosperity, an' has ta inwent ways of separatin' his self from th' filthy stuff. Anyways, that's th' way it looks from where I sit, or he wouldn't have dented th' bankroll fer th' turbin. How I gets my first draft of th' turbin is like this:

One night w'ile we are splittin' out his bit from my bit in th' privilege-car, th' bling-bling ol' rattler sprouts a hot-box. Th' flames jumps so high that they comes in th' window, an' our train-master tells th' bunch that th' car has ta be set out at th' next sidin'.

Does th' gang quit? No! Why? Because ya can get yourself 'most anythin' from sardines ta hair-oil on that little rattler. Besides, they is a Pete on that car where most of th' boys has planted their bankrolls. So we sticks with th' car that night.

Red an' me has plenty of time ta loosen up with th' things that's sizzlin' in our domes. But I don't get no chance ta say nothin' because my pardner is all steamed up over a bran'-new scheme of his.

It seems he ain't satisfied with draggin' down twenty ta fifty bucks a day. No, not a tall. An' why? Oh, jes' because he's got a bug in his bean about wantin' ta be a performer.

Get that? Why, some of them hams don't collect more than six seeds a week!

But Red, he thinks it's more classy than bein' a low-down candy-butcher, hence th' squawk.

Well, we've got a long night in front of us, an' we has ta put in th' time someways, so I listens ta th' ravin's of my stage-struck pardner. It's a magic act this time. He's steamed up fer fair an' is spielin' away a mile a minute. After a w'ile, when his face gets tired, he asts me fer my dope on th' lay-out.

"Red," I says, "adwice is somethin' you gets fer nothin', an' it's usually worth it; besides, a guy that's peddlin' out th' stuff don't always know what he's beefin' about. But take it from me, Red, an' lean away from that magic stuff."

"That's jes' like you, Slim, ev'ry trip!" he cracks ta me. "Ye're always puttin' a crimp in a guy's ambitions. Now when I has a chance ta frame myself fer a good magic act, ya tries ta slam the idear."

"Red," I tells him, "your only magic stunt I knows of is where ya turns a beer inta a man. It's th' best trick ya do, an' it lets ya out as a magician."

"Aw, can th' comedy. Listen, Slim; I know a buncha slighter hand tricks with coins an' cards, an' with this new stuff I oughta shine as a magician."

"*Shine* is good, Red," I says. "Heavy on th' shine part. Get this, Red! If you're a magician, Keller is my uncle!"

"Save that fer th' minstrels," he growls.

"Don't get peeved," I says. "What is this new stuff, an' where da ya get it?"

"It's like this, Slim. Raja is blowin' th' outfit on Saturday, an' he wants ta unload a Hindu trick. The 'turbin of inwisibility,' he calls it."

"Wad da ya mean, turbin of inwisibility?" I asts him.

At th' same time I'm hep that this Raja person is gettin' ready ta put one acrost. He's th' coffee-colored bird what works a magic act in th' kid show; says his father is a East Indian prince.

"This turbin will make me inwisible," Red says. "All I has ta do is wind it round my bean, say some magic words, an' people can see right through me."

"They'll never see through you, Red," I says, "turbin or no turbin—you're too thick. I s'pose ya saw Raja go through with this act?"

"Sure, an' so have you; it's th' way he disappears when he works th' Hindu trunk mystery, an' that's th' trick I want ta strengthen my magic act."

"Th' turbin ain't got nothin' ta do with th' trunk mystery," I says. "They is a trap in th' cover; th' only mysterious thing about th' act is how he gets by with such crude stuff. Did ya ast this faker ta pull th' stunt without th' trunk?"

"Not exac'ly," he tells me. "Ya see, Slim, it's like this: th' turbin is a wery mysterious piece of goods; it's been passed along from one guy ta another—Yogi, is what Raja calls these mugs—fer thousan's of years. Th' only bad feature about this turbin is, it can only be used by th' same guy fer a thousan' an' one times; th' las' time ya puts it on ya disappears ferever.

"Now, Raja says he's somewheres along in th' nine-nineties, but has kinda lost track of th' exac' count, an' he's leary about takin' a chance on goin' away fer keeps. Only fer that he'd show me that this rag was th' real goods. He ain't even been workin' th' trunk-mystery fer th' las' coupla days jes' on that account."

Sufferin' Mike! Whadda ya know about that line of bunk? An' what did *I* say? What *could* I say? When a guy like Red—a wise *hombre* that's hep ta all th' sap games—will tumble fer this inwisibility gyp, they ain't a possible of any one steerin' him away from th' gaff; so I jes' says:

"Yes! Yes! Go on!"

"Raja," he raves along, "wouldn't leave any one what didn't have a high moral character like me have this turbin. Ya see, Slim, they ain't nothin' ta stop a guy from dollin' up in this magic millinery, then walkin' inta a bank an' cleanin' it up in broad daylight. Raja might be kiddin' about th' 'high moral character,' an' then again he mightn't.

"Ya needn't tip my mitt, Slim, but jes' as soon as I connect with this wonderful rag—it's me fer a bank. When I stagger out they can hang a 'To-Let' sign in th' winder. That's how clean I'll work!"

"I'd like ta be around when that bank stuff comes off," I tells him. "But, fer a starter," I says, "why don't ya try it out on a bartender an' try ta make yer escape without settlin' fer a scuttle of suds?"

"I might give it some simple test like that ta make sure it's workin' right," he says. "They is some magic words ya have ta say in Hindu, an' I'll prob'ly have ta practise a little."

"How much of th' bankroll is Raja goin' ta leave ya keep?" I asts Red. "Or, in other words, how much is he goin' ta mace ya for this strip of dry-goods?"

"Only a century," he tells me.

"An' yer goin' ta send a hundred tough ones after a daffy trick like that? That's th' limit fer t'-night. Let's tear off a little of th' sleep-stuff."

It's a swell summer night, so Red an' me hops off th' rattler an' pounds our lugs in th' grass.

Next mornin' th' car is pulled inta

town. Red an' me gets busy framin' up our juice-joint. I ain't sayin' nothin' about th' turbin, but I'm thinkin' that if Red is goin' ta fall fer it, maybe I can squeeze a laff outa th' deal. Take it from me, there's some pretty smooth grifters troupin' round with th' tent-shows, an' when they gets ta hookin' each other th' stuff that comes off is rich.

That afternoon Red oozes inta th' joint an' whispers ta me:

"I got it, Slim."

We wasn't busy jes' then—all th' yaps is in th' big top, an' we has a coupla punks workin' over th' seats—so I asts him ta let's have a look an' see how th' turbin works. Understand that I'm hep that it's a gyp, pure an' simple.

Red an' me goes in th' back part of th' joint where no one can get a flash at us. He produces about ten feet of cheese-cloth, which he winds around his granolithic dome, w'ile he whispers some "magic words" that sounds like, "Call him, Sammy." Then he says ta me:

"Can ya see me, Slim?"

Can ya picture th' big, overgrown, double-breasted simp? He's standin' there as big as a church, an' he asts me can I see him!

"No!" I yells. "Not in a thousand years!"

"On th' square, Slim, am I inwisible?"

"Posolutely," I tells him. "Jes' as absent as a cop in a riot."

On th' level, that bling-bling boob is happy. But he's kinda leary in case they is something queer with my glims, or he might 'a' been half wise that I'm bullin' him. Anyways, he asts me not ta put th' bunch hep ta th' turbin so's he can try it out on th' train that night. Then he unwinds th' magic rag, plants it under his coat, an' fishes out a note-book.

"I got ta keep cases on th' number of times I use this thing so's I won't get balled up an' go away fer keeps some day. If Raja was a good, clever gink like me, Slim, he'd have given th' bookkeepin' a play, too. If I do say so myself, Slim, I've got a head on *my* shoulders."

"Some dome, Red!" I says. "Some dome!"

Then I mooches out ta wise up th' bunch ta what's comin' off that night. It's glad tidin's fer th' boys; they're all keen fer th' turbin. Every one in th' outfit is hep, an' take it from me, if any of them got a peek at Red with th' drap'ry round his bean, they was ready ta walk right through him jes' ta show him that th' rag was th' real darb.

After th' night show, when me an' Red is in th' privilege-car, he asts me how would be th' best way ta pull th' act. I think th' best place ta work is in th' sleeper. He can frame himself with th' turbin out in th' westibule. I'll go first, an' he can trail me in w'ile th' door is open. Red thinks this is good dope, an' he drops fer it.

I was glad he did, because there might be a chance of some one in th' privilege-car crabbin' th' show, but th' wise ones had it framed with me ta stall in th' sleeper.

Th' audience is waitin' when I waft in an' tips them th' wink that th' game is on. Red is close ta my back, but th' bunch don't give him a tumble; as far as seein' him was concerned, they was all lookin' out th' window. He horns his way inta th' party an' grabs out a seat fer himself on th' edge of a berth. Then "E-Flat" Wheeler, a wind-jammer, cracks ta me:

"Where's that torch-top pardner of yours, Slim?"

Red stops grinnin' an' starts ta open his face; then he comes ta life an' remembers he's inwisibile. Since I'm th' only one in th' crowd that is supposed ta know Red is listenin', I has ta boost fer him even if I can't see him; it's th' proper play anyways, seein' I'm his pardner.

"Can that torch stuff, Wheeler," I says. "Red's a prince even if you don't like th' color of his roof. Ya know ya couldn't call him that ta his face an'

get away with it; he'd tear inta ya so fast that ya wouldn't know whether he was one guy or seven."

"Too bad I couldn't tell it ta him," says Wheeler. "Why, Slim, that big stiff couldn't lick an ice-cream horn! If he ever bats an eye ta me, I'll hang somethin' on his lamp so hard that I'll knock his hair inta th' next county!"

"An' ya could do that little thing, E-Flat," says th' Human Pin-Cushion. "That big bum ain't no good except fer ta chase round with th' Janes. That last trimmin' he got from th' snake woman was a pip. She took him down th' line fer th' entire bankroll, an' when he's cleaned she gives him th' gate.

"That guy certainly loosens fer th' queens, but he's always handcuffed when it's his turn ta buy a round fer th' boys. Why, on th' level, that gink wouldn't squander a jit ta see th' battle of Waterloo fought over again!"

Red's face is gettin' red like his hair, an' I can see his knucks doublin' inta bunches. It's up ta me ta come ta th' front an' boost.

"You guys had better ease away from that line of chatter," I says, "or I'll have ta battle ya myself. Red's my pardner, an' I won't stand fer any more of th' anvil noise. Da ya make me?"

"Oh, all right, Slim!" says Wheeler. "They ain't no need of ya gettin' all steamed up over it. You're his pardner an' a right guy besides, or ya wouldn't offer ta do battle fer th' big stiff."

The Fat Lady breezes inta th' car jest in time ta get an earful of th' argament.

"Hello, boys!" she chirps.

Then she starts ta bawl E-Flat an' th' Pin-Cushion.

"Where da you roughnecks get off at ta call my friend Red such awful names? If he was here ta defend himself, ya wouldn't dare pull such stuff. Slim, where is th' dear boy ta-night?"

Of course, she's hep ta th' turbin. In fac', she's starin' right through Red w'ile she's astin' me where is he. Then she waddles over an' sits down on him.

He's inwisible then if he wasn't before, but he keeps his nerve an' makes no squawk.

Fatty acts like she didn't know she was sittin' on any one. She's laffin' an' kiddin' with th' bunch, tellin' us what lovely hair Red's got an' what a perfec' gentleman he is.

Red can't see what's comin' off. Th' gang is all wearin' large smiles, an' winkin' ta each other w'ile they takes turns at knockin' an' boostin' him.

After a w'ile we could hear Red blowin' like a nag with th' heaves, so I gives th' fat queen th' office ta pull her freight.

"Well, so-long, boys," she says; "it's me fer th' sheets."

Red crawls out behind her, because it's th' best chance he's got of makin' his exit. I drilled it inta his bean when we staged th' act that it might look queer fer a door ta open an' close with no one in sight.

When th' bunch is sure he's outa hearin' they cuts loose fer fair. Th' sleeper is like a madhouse. Every one is laffin' an' thumpin' some one else on th' back, or else they're rollin' on th' floor. If ya happened ta get a slant at us jes' then, an' ya wasn't hep ta th' joke, you'd sure say we was squirrel-food.

Red don't sneak back ta th' car till he thinks we're all in th' hay. When I see him next mornin', he's thick as a board because I didn't battle th' bunch fer knockin' him. He tells me he heard every word they said, but he didn't wise me about th' fat Jane floppin' on top of him.

I turns th' news over ta th' boys, an' we've got it framed fer another session after th' night show.

But they ain't nothin' doin'; Red ducked out of th' juice-joint about ten o'clock that night, an' I didn't lay me glims on him again till mornin'. Then he pulls on ta th' lot lookin' kinda weary an' walkin' like he was lame. First crack outa th' box, he asts me ta do him a favor.

"Surest thing," I says. "Who da I have ta battle?"

"It ain't nothin' like that, Slim," he

tells me. "Come in back of th' joint a minute an' I'll give ya an earful of my trouble."

Whadda ya s'pose Red wants me ta do? Ya'd never guess it in a thousan' years, so I'll spill it ta ya quick an' save time.

He wants me ta pick some bird-shot outa his hide!

"What kinda stuff is this ye're tryin' ta put acrost?" I asts him. "Am I supposed ta laff, or da ya expec' me ta bust out cryin'?"

"'Taint no joke, Slim. This stuff is level up."

"Been tryin' that bank clean-up?" is th' next question I heaves at him, because I has a hunch that, someways or other, the turbin is mixed up in th' deal.

"Nix on th' bank stuff," he growls. "I'm off that yen. I gathered this assortment of lead w'ile I was makin' a stab fer a 'gooseberry.'"

"Oh, I see," I tells him. "Ya ducked out ta cop a clothes-line with th' turbin ta make ya inwisible. Why didn't ya jes' cut the rope an' beat it fast like th' rest of th' boys do?"

"Well," Red says, "th' las' time I worked that quick getaway I had bum luck, an' grabbed myself an armful of she-clothes that I couldn't wear. But nix on th' alibi, Slim. Get busy an' lift some of this lead outa my system."

I hears th' rest of th' story w'ile Red is layin' with his face in th' clover an' I'm pryin' th' shot outa his hide with my jack-knife.

Like I says before, Red went out ta hustle a gooseberry. He finds it all right, but he's got so much confidence in th' turbin that he strolls right up ta it in th' bright moonlight an' starts ta strike matches ta read th' size on the neckband of a shirt!

Bough! Bough! says a shotgun.

Red stops a coupla quarts of lead, an' right away he loses faith in th' turbin. Then he starts ta sprint, with th' rube chasin' him. Hiram ain't got nothin' on except a nightie, but he's got a man-size pitchfork in his mitt.

"I've got too much metal in me ta run good," Red tells me. "Th' Hiram is creepin' up on me every step. I can almost feel that pitchfork spearin' my swell new pants when we comes ta a stone quarry. Then I gets my brain tuned up an' workin'.

"I remembers th' hick is in his bare feet, so I steers him off th' sandy road acrost th' rocks. He only follers fer a few steps; then th' chips of stone put his feet ta th' bad.

"When he sees he can't stop me, th' yap slings th' fork an' tries ta harpoon me. It jes' skims my bean an' takes th' turbin with it. He limps up ta th' fork then, and gloms in th' rag; probably he thought it was something I picked off th' line.

"Now, Slim," says Red, "I'm hep that you an' th' bunch was kiddin' me in th' car th' other night. Don't wise them ta this gooseberry stunt an' you an' me is square, but if any of that bunch feels like pullin' some funny cracks about th' comedy in th' sleeper, ya can tell them fer me, Slim, that I'll crown th' first guy that says 'Turbin.'"

Believe me, that was th' last we heard of th' magic turbin. I tips th' bunch, an' they laid off th' kiddin', because Red ain't no cripple an' can mix it with th' best.

THE ROUNDHOUSE FOREMAN SAYS:

You don't want a better job any more than the boss wants a better man.

FROM THE RAILROAD MAN'S MAGAZINE

THIRTY YEARS A DYNAMITER.

EMANUEL BARE, RAILROAD EXPLOSIVE EXPERT

THE Pennsylvania Railroad has just retired on pension a man who had bossed all the dynamiting jobs on the Baltimore Division for thirty years. In that time he had handled tons of explosives without a serious accident.

When Mr. Bare was made a track foreman in 1886, after seventeen years of service on the Pennsylvania, and detailed to explosive work, he went to a dynamite factory and spent several months learning the business He thus made himself so efficient that for many years other Pennsylvania employees engaged on work with explosives went to him for instruction.

All the blasting for track improvements and other construction work on the Baltimore Division was done under his supervision.

By the Light of the Lantern

Ask us what you want to know

WE want to be as useful as possible to our readers, but, because of the great popularity of this department, we are obliged to impose certain restrictions. It is limited to the answering of questions of an informative, technical, or historical nature concerning the railroad business and allied occupations only. We cannot answer requests for positions or give information regarding employment. All letters should be signed with the full name of the writer, as an indication of his good faith. We will print only his initials. The editor begs that readers sending in questions will not be disappointed if the answers do not appear as early as expected. It frequently takes weeks to secure correct answers, owing to the complexity of the questions. All questions are answered free of charge. The editor earnestly requests his readers to bring immediately to his attention any errors they may find in this department. He reserves the right to refrain from answering any question.

WORLD'S RAILWAY MILEAGE.

B. M., New York.—From the latest statistics available the following is a summary of the railway mileage of the world by geographic groups and from which it will be observed that more than half the entire amount is in operation on the American Continent.

	Miles.
Europe	207,432
America	327,070
Asia	63,320
Africa	22,892
Australia, etc	19,267
Total	639,981

BOOKS ON RAILROADING.

J. P. S., Elizabeth, New Jersey.—We could not publish in this department a complete list of all the books published on railroad construction, maintenance and operation. Suggest that you obtain descriptive catalogues of the books handled by the McGraw-Hill Book Company 239 West 39th Street, New York, and also the Angus Sinclair Company, 114 Liberty Street, New York. Such catalogues may be had on request to the concerns mentioned.

THE QUEEN AND CRESCENT ROUTE.

B. M. S., Washington, District of Columbia.—The principal lines comprising the Queen and Crescent Route are: Cincinnati, New Orleans and Texas Pacific Railway; Alabama, Great Southern Railroad; New Orleans and North Eastern Railroad; Alabama and Vicksburg Railway, and the Vicksburg, Shreveport and Pacific Railway.

RICHMOND AND DANVILLE.

(2) The above road is now part of the Southern Railway Company, which was originally organized as successor to the Richmond and Danville Railroad

RAILROAD PAPERS.

M. J. F., Jacksonville, Florida.—The *Railway Journal* to which you refer is published monthly by the Railway Journal Publishing Company, 327 South La Salle Street, Chicago, Illinois. We could not publish in this department a complete list of all the railroad and allied publications issued in the United States and elsewhere, for they are indeed numerous If you will tell us exactly what kind of railroad publications you have in mind we will be glad to furnish a list with addresses, *et cetera*.

THE ROCK ISLAND LINES.

D. W. S., Cherokee, Iowa.—What are the Rock Island Lines, and what is the mileage and equipment of same?

The Chicago, Rock Island and Pacific Railway Company operates its lines of railway independently, and is interested through ownership directly or indirectly of at least a majority of the capital stock of certain subsidiary companies, each of which operates its property independently.

The lines of the Chicago, Rock Island and Pacific Company together with the lines of its subsidiary company, the Chicago, Rock Island and Gulf Railway Company, comprise what is known as the Rock Island Lines, operating 8,133 miles, 1,662 locomotives, and 49,840 cars.

SPEED RECORDERS.

(2) Speed recorders are placed in the cab for the guidance of enginemen so that they may know at what speed the locomotive is traveling. In some States their application is required by law. The Boyer Speed Recorder to which you refer is manufactured by the Chicago Pneumatic Tool Company, Fisher Building, Chicago.

HORSE-POWER FOR LOCOMOTIVES.

(3) Although the term horse power is not generally used with much significance in connection with the work done by locomotives, yet there are many times when it is very interesting to make comparisons between locomotives in this way. Horse-power is represented by the raising of 33,000 pounds through a space of one foot in a minute.

Careful experiments have shown that if we represent the velocity of a locomotive in miles per hour by V and the tractive force by T, the horse-power is equal to the velocity multiplied by the tractive force and divided by 375. Thus if the tractive force of a locomotive is 49,800 pounds and the velocity 25 miles per hour, the horse-power will be 3,320.

TRACTIVE POWER.

(4) The following is the formula for finding the tractive power of a simple locomotive:

T—tractive force at rim of driving wheels in inches.
P—the boiler pressure in pounds per square inch
C—diameter of cylinders in inches.
S—stroke in inches.
D—diameter of driving wheels in inches.

Square diameter of cylinder in inches, multiply by length of stroke in inches, multiply by 85 per cent of boiler steam pressure and divide by diameter of driving wheels in inches. The following is the formula:

$$T = \frac{C^2 \times S \times .85P}{D}$$

Example:

What is the rated tractive force of a locomotive with cylinders 24 inches in diameter, 32 inches stroke, boiler pressure 200 pounds per square inch, and driving-wheels 63 inches in diameter?

$$24 \times 24 = 576 \times 32 = 18,432 \times 170 = 3,133,440 \div 63$$

Equals 49,800 pounds.

In actual operation it is usual to deduct 10 per cent from the rated power on account of friction.

TWO CYLINDER OR CROSS COMPOUND LOCOMOTIVES.

The formula is:

$$T = \frac{C^2 \times S \times 0.6P}{D}$$

in which
T—rated tractive force in pounds.
C—diameter of high-pressure cylinder in inches.
S—stroke of piston in inches.
P—boiler pressure in pounds
D—diameter of driving wheels in inches.

MALLET COMPOUND LOCOMOTIVES.

The formula given above, for cross compound locomotives, is also applicable to Mallet type locomotives, the result being multiplied by two as the Mallet type has four cylinders. The formula thus modified is as follows:

$$T = \frac{C^2 \times S \times 1.2P}{D}$$

The formulas for two-cylinder and Mallet compound locomotives, assume a cylinder ratio of approximately 2.35 to 2.40.

THE L. AND N. E. RAILROAD.

F. S. M., Newburgh, New York.—The Lehigh and New England Railroad was chartered in 1895 as successor to the Pennsylvania, Poughkeepsie and Boston Railroad, whose property they bought under foreclosure, and has since absorbed the Northampton Railroad Company, the Lehigh and Delaware Railroad Company and the Wind Gap and Delaware R. R.

The company also owns the Pochuck Railroad and controls the Campbell Hall Connecting Railroad. The Lehigh and New England operates 296 miles, 59 locomotives, and 2930 cars.

LEHIGH & HUDSON RIVER RAILWAY.

(2) The lines owned by the above road extend from Maybrook, New York to Belvidere, New Jersey, and from Easton, Pennsylvania to Phillipsburg, New Jersey, 75 miles in all. The road began operation in 1882 and has since absorbed or merged the Orange County Railroad; South Easton and Phillipsburg Railroad

of New Jersey; the South Easton and Phillipsburg Railway of Pennsylvania and the Mine Hill Railroad

By a contract entered into by the Lehigh and Hudson River Railway and the Pennsylvania Railroad Company, the latter has the use of this line to reach the Poughkeepsie Bridge, while the Lehigh and Hudson River uses the Pennsylvania tracks between Belvidere and Phillipsburg, New Jersey. This road also has trackage agreements with the New York, Ontario and Western for the use of their line between Burnside and Campbell Hall, New York, so as to connect with the West Shore and the Wallkill Valley Railroads.

WOODEN CARS.

(3) Does the Pullman Company make any wooden cars now?

We suppose they would build them for anybody that wants them. The number of passenger-cars constructed of wood regardless of what kind during the past year has been a negligible quantity.

RAILWAY PHOTOGRAPHS.

G. W. E., Chester, Pennsylvania.—We know of no concerns having photographs of locomotives and other railway pictures for sale In regard to the picture which appeared in the RAILROAD MAN'S MAGAZINE and to which you particularly refer would inform you that it was taken for a special purpose, and a duplicate cannot be supplied. Sorry, for we would gladly give you one, if we had it.

BOSTON'S NARROW-GAGE ROAD.

L. M., Pittsburgh, Pennsylvania. What is the name of the narrow gage road between Boston and Lynn, Massachusetts?

The Boston, Revere Beach and Lynn Railroad is probably the line that you refer to as it is of 3 feet gage. This road runs from East Boston to Lynn and Winthrop, Massachusetts.

(2) Does the Western Maryland control the Philadelphia and Reading, and what company controls the Central Railroad of New Jersey?

No. Both the Philadelphia and Reading Railway and the Central Railroad of New Jersey are controlled by the Reading Company.

(3) How many miles of second, third, and fourth track has the Pittsburgh and Lake Erie Railroad?

One hundred and fifty-seven miles 2d track; 48 miles 3d track; 46 miles 4th track. The figures given include all owned, leased and operated lines. The total length of the road is 224 miles.

(4) Western Maryland Railroad Car Number 5409 is a steel, twin-hopper car of 100,000 pounds capacity.

COUNTRY'S MOST EASTERN CITY.

H. J., Pittsburgh, Pennsylvania.—Eastport in Washington County, Maine, originally called Moose Island, was later incorporated under its present name in honor of being the most eastern city in the United States.

CONSOLIDATION TYPE ENGINES.

(2) What is the difference between consolidation and consolidated engines?

To the best of our knowledge there is no such thing as a consolidated engine. Occasionally we hear of a consolidation type engine, which is a locomotive having a two-wheel front truck and four pairs of coupled driving-wheels, but no trailing-truck, referred to as a consolidated engine. But this is wrong.

TRUNK LINES.

(3) The term "trunk line" is used to indicate the main line of a railroad, canal, telegraph, or telephone system, or similar routes.

SAFETY APPLIANCES.

H. B. L., Durant, Oklahoma.—Can a railroad company be compelled to use a safety appliance, and how many railroad cars are there in the United States?

Yes. Under the "Safety Appliance Acts" the Interstate Commerce Commission can and now does compel by law the application of various safety appliances to railway cars, locomotives, *et cetera*. If steam-railway cars are referred to, there are approximately 2,600,000 cars of all kinds in use in the United States.

CHICAGO RAILROAD STATIONS.

J. M., Youngstown, Ohio.—Is there a union station in Chicago, Illinois, where all the principal roads enter?

There is a Union Passenger Station at which quite a number of roads enter, but there is no general union station. In addition there are the Grand Central Depot, Dearborn, Central and La Salle Street Stations, and the Chicago and North Western Passenger Terminal.

(2) Who was the elder railroad president before death the late James J. Hill or the late Henry G. Davis?

Henry G. Davis, born November 16, 1823.
James J. Hill, born September 16, 1838.

(3) How many miles of double track has the Norfolk Southern Railroad?

Ten miles second track.

DERAILING-SWITCHES.

E. W. F., Cincinnati, Ohio.—A derailing-switch is one designed so as to turn a train off the track for the purpose of preventing it from running into danger; used in connection with stop signals on lines approaching grade crossings of other railways, or drawbridges, or any particularly dangerous place

It may be interlocked with a stop signal so that when the derail is "open," to derail, the signal must indicate stop; and before the signal can be cleared the derailing switch must be set so as not to derail an approaching train.

A diverging track, if not too sharply curved, serves the same purpose without causing derailment. Derailing switches worked by hand (sometimes not interlocked with the switch) are used near the ends of outlying side tracks, especially where a movement from the siding to the main line has the benefit of a descending grade. Such a derailing switch is regularly left open, so as to derail any cars which may by accident run from the siding toward the main line when no attendant is near.

EARLY AUTOMATIC BLOCKS.

A. N., Milwaukee, Wisconsin.—No individual is generally credited with the invention of what is now called automatic block signals. Automatic signals actuated by the passage of the wheels along the rails were tried in the United States almost as early as manual block signals

Thomas S. Hall began experiments in Connecticut as early as 1866 and five years later had 16 miles of the Eastern Railroad (now part of the Boston and Maine) equipped with automatic signals. At the time of the Centennial Exhibition (1876) Rousseau had an apparatus operating in Philadelphia.

These early inventors used track treadles which, when pressed down by the wheels of a passing train, opened or closed an electric circuit in a wire carried on poles from one end of the block to the other This method was developed by Hall and his successors, but this has since been superseded by the rail circuit in which the rails of the track take the place of the wires, so that the oldest form of automatic signals, as we understand the term today, was the clockwork apparatus developed by the Union Switch and Signal Company.

The first important installation was that on the Fitchburg Railroad, now a part of the Boston and Maine Railroad, from Boston to Waltham, Massachusetts about 1879, although Frank L. Pope had made experiments on the Boston and Lowell and also in Philadelphia, Pennsylvania, some years earlier.

(2) Must one be able bodied in order to become a brakeman, also what is the average pay?

Yes. Three dollars a day.

HIGHWAY-CROSSING BELLS.

(3) The highway crossing alarms or warnings are usually some form of electric bell mounted on a post near a crossing to announce the approach of trains. These bells are generally actuated by the train passing over a track circuit or a track instrument situated at a suitable distance from the crossing.

The connection between the starting-point and the relay is made by line wires, and the instrument is set so as to keep the bell circuit closed a predetermined length of time, which can be varied from twenty seconds to three minutes, as may be convenient.

FUSEES.

N. E. N., Chicago, Illinois.—Fusee signals consist of a stick with a sharp point which can be thrown from a car to stand upright in the track. It contains a chemical which burns with either a yellow, green or red light. A train finding a fusee on or near its track must stop and extinguish the fusee and then proceed with caution prepared to stop short of a train or obstruction.

These things can be furnished by the following concerns.

Central Railway Signal Company, Chicago, Illinois.
J. Jackson's Sons, Philadelphia, Pennsylvania.
C. H. Whall & Co., Boston, Massachusetts.
Consolidated Fireworks Company Pittsburgh, Pennsylvania.
Sherburne & Co., Boston, Massachusetts.

MICROMETER.

(2) Unless you tell us what kind of a micrometer you have in mind, we cannot tell you anything definite in regard to it. These tools are now very generally in use among mechanics employed on work requiring uni-

formity and accuracy. These calipers may be divided into two classes, the yoke and the beam patterns, and perhaps the yoke pattern is in more general use.

In regard to the reading of them, micrometers of this class are usually provided with a screw having forty threads per inch. The barrel is graduated to tenths and fortieths of an inch. Thus one revolution of the screw advances the thimble one division on the barrel, which equals 1-40 of an inch or .025 inch.

As the circumference of the thimble is divided into twenty five equal parts, 1-25 of one revolution of the screw advances the measuring point 1-25 of 1-40—1-1000 of an inch. When the end of the measuring point and the anvil come in contact, the zero points on barrel and thimble should coincide, thus avoiding the necessity of a correction for each reading.

As the measuring faces and screw wear slightly, it is necessary to provide some means of adjustment in order to keep the zero reading correct. In this particular instrument the barrel may be rotated on the shank sufficient to bring the lines correct. In others the anvil may be forced ahead by means of a small screw in the yoke.

REGENERATIVE BRAKING.

J. D., San Francisco, California.—I would like to know how regenerative braking on the electrification of the Chicago, Milwaukee and St. Paul works. How it holds the train and feeds back to the line?

With regenerative braking, the motors become generators which absorb the energy of the descending train and convert it into electricity, thus restricting the train to a safe speed down the grade, and at the same time returning electric power to the trolley for use by other trains

The strain on drawbars and couplings is reduced to a minimum since the entire train is bunched behind the locomotive and held to a uniform speed. The electric-braking mechanism automatically controls the speed by regulating the amount of energy fed back to the line. This smooth and easy descent is in marked contrast to the periodical slowing down and speeding up of a train controlled by air-brakes.

The usual speed of the electrically hauled freight-train is 15 miles per hour ascending and 17 miles per hour descending the maximum grade, but half these speeds can easily be maintained with series connections of the motors should conditions require it.

In case there are no other trains between the substations to absorb the power generated by a descending train, this power passes through the sub-station machinery, is converted from direct to alternating current and fed into the distribution system connecting all sub-stations.

The power company's lines are so extensive and the load of such a diversified character that any surplus power returned by regenerating locomotives can readily be absorbed by the system; credit is given for all energy returned

The advantages of regenerative braking may be summarized as follows:

Elimination of difficulties incident to the use of air brakes on heavy freight-trains when descending mountain grades.

Elimination of brake-shoe and wheel wear with resultant reduction in maintenance.

Reduced wear on tracks, especially on severe curves.

A probable saving of approximately 15 per cent in the total power consumption

Maximum safety in operation assured by a duplicate braking-system relieving the air-brakes.

The entire absence of grinding of the brakes which is especially disagreeable on a heavy passenger-train.

Increased comfort to passengers and reduced wear and tear on freight equipment, owing to uniform speed on grades.

ORDER OF THE RED SPOT.

F. S. M., Newburgh, New York.—The Order of the Red Spot is an Erie Railroad organization. It is an honor conferred on engineers for efficiency in locomotive operation. If the Erie engineer keeps his engine clean, economizes on coal and water and keeps his running schedule he is allowed to have the number-plate on the front of the smokebox of his engine painted red with the numerals in silver.

If an engineer's excellence in these respects is something unusual, in addition to the red spot he is allowed to have his name painted in gold letters on the engine cab. It may be added that the membership throughout the Erie Lines is quite large.

DUTIES OF SHOP-BOYS.

T. H. B., Bucyrus, Ohio.—A hammer-boy, so-called, is a boy whose duty it is to attend to a steam hammer. The steam valve is moved by a lever similar to the working of a pump handle, the weight and speed of strokes being variable at the will of the operator. It is easily learned, but requires close attention. The duties of a tool boy is to collect tools that may be requiring sharpening or repair, and to replace them by other tools ready for use.

A shop-boy may be said to be ready at all times for such duties as his superiors may call upon him to do in the line of the work in which the workmen may be engaged. A rivet boy usually operates a portable bellows with

one foot, balancing himself on the other foot, and managing the heating of the rivets by the use of a pair of tongs, and conveying or throwing the heated rivets as the occasion may call to the men engaged in riveting

The age and general description of the boy referred to would be the making of a good candidate for the position, provided he had the necessary physical and mental activity.

CUBICAL CAPACITY.

C. G. R., Brooklyn, New York.—What is the formula for finding the number of cubic yards in a box or bin?

At various times I have been required to find the cubic yards of boxes or bins, but have been unable to find a simple one. For example, a bin is 6 feet long, 5 feet wide and 4 feet deep. What is the cubic capacity?

Multiply $5 \times 6 \times 4 = 120 \div 9 = 13\ 1\text{-}3$ cubic yards. The capacity in cubic feet is 120, and there are nine cubic feet in a cubic or solid yard, there are 13 1-3 cubic yards in the bin referred to. The most elementary book on arithmetic will help you to solve harder problems than this

FREIGHT-CARS.

T. S., McKee's Rocks, Pennsylvania.—Norfolk and Western Railway Car Number 78972 is a steel gondola hopper-bottom car of 115,000 pounds capacity. The outside dimensions of this car are 31 feet 7¼ inches long and 9 feet 9½ inches wide. The inside measurements are 30 feet ½ inch long, 9 feet 2 inches wide and 9 feet 3 inches high.

(2) Bessemer and Lake Erie Railway Car Number 41434 is a steel hopper-car of 100,000 pounds capacity. The outside dimensions are: 31 feet, 8 inches long, and 10 feet 2 inches wide. The inside measures 30 feet long, and 9 feet 3 inches wide.

(3) Bingham and Garfield Railway Car Number 1406 is a steel ore-car 28 feet long, 10 feet wide outside; 23 feet 10 inches long, 9 feet 11½ inches wide, and 6 feet 9½ inches high on the inside. The capacity of this car is 120,000 pounds.

BINGHAM AND GARFIELD RAILWAY.

(4) The above road commenced operations October, 1911. It was constructed primarily to handle the ore of the Utah Copper Company to the mills and smelters, but is also operated as a common carrier. The road operates 29 miles, the main line extending from the mines to Garfield, Utah, where it connects with the San Pedro, Los Angeles and Salt Lake Railroad.

The rolling-equipment consists of 19 locomotives and 724 cars.

RAILROAD Y. M. C. A.'S.

(5) There are approximately 250 railroad Y. M. C. A.'s in the United States.

STEEL CARS.

(6) In regard to your question as to whether there are more steel cars in use in the United States than in England. No figures are available at this time. However, there are infinitely more steel cars in use in America than in England. There are probably more in use here than on the entire continent of Europe.

WOMEN STENOGRAPHERS.

R. M. M., Burlington, Iowa.—Women stenographers are getting to be quite common in the leading railroad offices. Their wages in the Middle West range from nine dollars to eighteen dollars per week according to the degree of skill and length of service. There are few lower or higher than these figures.

Application should be made in person to the division superintendent. Certificates as to qualifications, and testimonials as to experience, if available, are helpful, but not essential, as the applicant will be tested at short range. Be of high courage and you will find railroad men to be real gentlemen.

ELEVATION OF RAILS.

T. L. P., Jamaica, New York.—What is the proper elevation for curves of from ten to twenty degrees for speed of thirty-five miles per hour? And give rule of determining this, and also the simplest rule for determining degree of curve?

The amount by which the outer rail should be elevated on a curve may be determined from the following formula adopted by the American Railway Engineering and Maintenance of Way Association:

$$E = .00066\ DV^2,$$

E—elevation of outer rail in inches.

Where D degree of curve

V—velocity of train in miles per hour

Hence $.00066 \times 10 \times 1225 = 8.085$ inches.

Ordinarily an elevation of eight inches is not exceeded, and speed of trains should be regulated to conform to that elevation. In regard to degrees of curves, a simple rule which gives results close enough for practical purposes is to take the middle ordinate of a 62-foot chord; the length of the middle ordinate in inches equals approximately the degree of curvature.

In other words stretch a line 62 feet in length touching the outer edge of the inner rail Measure at the center of the line the distance from the rail to the line, and the number of inches will correspond to the number of degrees of the curve.

C. & N. W. SUPERINTENDENTS.

E. K., Waupon, Wisconsin.—On the Chicago and North Western Railway, the division superintendents and their addresses are as follows:

C. E. Andrews.....Escanaba, Michigan.
R. F. Armstrong....Mason City, Iowa.
W. D. Beck (Term.)..Chicago, Illinois.
M. K. Boyle.....Winona, Minnesota.
F. J. Byington.....Boone, Iowa.
J. P. Cantillon.....Eagle Grove, Iowa.
G. W. Dailey.....Chicago, Illinois
H. E. Dickinson....Huron, South Dakota.
J. W. Doyle.....Baraboo, Wisconsin.
H. M. Eicholtz.....Chicago, Illinois.
A. N. LaCombe....Green Bay, Wisconsin.
E. B. McClure.....Sioux City, Iowa.
F. R. Moulton.....Pierre, South Dakota.
F. O'Brien.....South Pekin, Illinois.
F. D. Pendell.....North Fond du Lac, Wisconsin
G. J. Quigley.....Antigo, Wisconsin.
B. E. Terpning.....Belle Plaine, Iowa.
C. T. Boone.....Casper, Wyoming.
L. N. Costley.....Chadron, Nebraska
C. H. Reynolds.....Norfolk, Nebraska.

ROADS INTO SALT LAKE CITY.

The following roads enter Salt Lake City, Utah:

Denver and Rio Grande Railroad.
Salt Lake and Los Angeles Railway.
Salt Lake and Ogden Railway.
Salt Lake and Utah Railway.
San Pedro, Los Angeles and Salt Lake Railroad.
Western Pacific Railway.
Union Pacific System.

Telegraphic & Telephonic

IF there is anything you want to know about the telegraph, telephone, or radio telegraphy if you have an operating problem that puzzles you — if you want to discuss a question of theory—write the RAILROAD MAN'S MAGAZINE. We have engaged a technical expert who is one of the leading authorities of the country on these subjects. Ask him. He knows!

ALTERNATORS FOR RADIO.

J. B. H., Brooklyn, New York.—The Goldsmidt alternator, or "singing wheel" produces a fine musical note due to a frequency of 50,000 to 60,000 oscillations per second. The rotor revolves at a speed of 3,000 r. p. m., producing 15,000 oscillations.

Current produced in the rotor is returned to the stator, producing a rotating field opposite in direction to the rotor, creating thereby a frequency of 30,000 per second. Each transfer from rotor to stator raises the frequency 15,000 per second, and in this way the frequency may be raised to 60,000 per second.

In an alternator of this kind it is not necessary to provide separate windings for the currents of different frequencies, as they will all flow in the same stator and rotor windings. The exciting energy is from 5 to 10 kilowatts for an output of from 100 to 200 kilowatts from the machine.

There is no fixed voltage rating for these machines. Comparatively low voltages are employed (about 4,000 volts at the secondary of the transformer.) The current flowing in the antenna circuit is dependent upon the high frequency resistance of the system. The high frequency resistance is practically thirteen times the ohmic resistance.

It is very difficult to entirely overcome iron losses at any frequency. In the Goldschmidt machine steel of a thickness of 0.05 m.m., insulated by paper about 0.03 m.m. thick is used. The best way to get away from iron losses is to employ an air transformer.

Instead of using a 110 volt generator it would be better to employ a 5-k.w. 250-volt, 500-cycle motor generator set, to energize a closed core transformer.

Your last question involves a simple operation of Ohm's Law. The resistance inserted to obtain zero current would depend upon what is regarded as zero. It is evident that with 110,000 ohms resistance you would have a current of 1

milliampere (.001 ampere). With eleven million ohms resistance across the terminals of the source of e.m.f., there would be a current of .00001 ampere flowing in the circuit.

The current capacity of the generator is immaterial. The conditions would be the same whether the machine generated one ampere or twenty-five amperes.

It is evident therefore, that as long as the terminals of the generator are joined by an actual conductor current will flow, and that nothing short of an open circuit will indicate theoretical zero current.

TELEGRAPH SCHOOLS.

G. F. B., New Haven, Connecticut.—None of the railroads in your section of the country maintains telegraph schools. There are several schools in New York City and in Boston operated as commercial schools.

We suggest that you communicate with Mr. N. E. Smith, Superintendent of Telegraph, New York, New Haven, and Hartford Railway Company, New Haven, Connecticut, advising him as to your age, also whether you would be willing to go to some small station along the road for the purpose of learning telegraphy.

ARC-LIGHT CARBONS.

G. ZIPRIK, Middletown, Connecticut.—We do not know of any complete work which deals with the manufacture of carbons for electric lamps. The following description, however, will give an idea of the processes involved.

The material from which ordinary carbon pencils are made is coke, a by-product of petroleum oil stills. The grade of coke employed differs somewhat from ordinary fuel coke, being somewhat darker, and has a specific gravity about one half that of the latter. High-grade carbons are made of lamp-black carbons, produced by burning coal tar in suitable chambers.

The coke is first passed through a bark mill where it is ground to pea size; then calcined by being placed in fire-brick furnaces, which when filled with the material is fired by the consumption of natural gas. After the fire has been started the retort is closed so that no air may enter.

The coke burns in its own gas, and, due to this, all volatile matter is driven off leaving a product which is about ninety-nine per cent pure carbon. The mass is then withdrawn and allowed to cool, after which it is ground in a burr stone mill to a fine flour, and is bolted through silk strainers into four grades.

The flour thus obtained is compounded with a binding material, which latter is a coal tar distillation in fine powder form. The compound is placed in a revolving heater in which a temperature of 200 degrees is maintained.

When cool the compound is ground in a centrifugal mill, reduced to a fine powder, and again bolted through revolving sieves. It is then ready for molding.

In high grade carbons made from lamp black, tar is used as a flux.

The specific resistance in microhms per cubic centimeter is about 4,000 at zero Centigrade. The resistance of ordinary arc light carbons 11 to 15 m.m., diameter is from .15 to .2 ohm per foot.

Another method of carbon manufacture is that known as the 'forcing' process. After the carbon has been prepared as explained in the foregoing it is formed into compact cylinders by means of hydraulic pressure and then fed to machine presses equipped with dies.

The size of the rod or pencil depends upon the size of the die; the carbon rods being forced out of the cylinders through the dies are deposited in grooved trays and broken off in lengths of about four feet.

RAILROAD TELEGRAPH SALARIES.

E. B. W., Belfast, Maine.—Operators working at stations where there is a sufficient amount of telegraph traffic to require the constant attention of the operator, or operators, are paid salaries ranging from $50 to $100 per month, depending upon the railroad company, and the part of the country in which the telegrapher may be employed.

On the New York Central Railroad the average pay of agents and operators is $66.75 per month. On Western roads the average rate is considerably higher than this.

On the New York Central Railroad the average pay of towermen is $73.30 per month.

The salaries of train-despatchers range from $100 to $175 per month. When vacancies in the train-despatching service occur, they are filled by appointing despatchers' copy-operators, or operators who have had long experience at terminal offices, to the positions.

There are many interpretations of just what is meant by the words "first class operator." A reasonable standard would be the requirement that a first-class operator should be able to copy by pen (legibly) or by typewriter at the rate of forty telegrams per hour, turning out clean copy. Also that he should be able to send forty telegrams per hour in clear, easily read Morse.

In addition to his ability to send and receive, the more an operator knows about the theory and operation of telegraph lines and apparatus, and about traffic and train-rules, the greater is his claim to rating as a first-class telegrapher.

Telegraph Age, published at 253 Broadway,

New York, and the RAILROAD MAN'S MAGAZINE are the two periodicals devoted to the interests of telegraphy

As to which branch of the business offers the greatest opportunity for advancement, Railroad Telegraphy; Commercial Telegraphy; Radio Telegraphy; or Cable Work, we would say that in each of these lines a great many men have achieved success. In a few instances individuals have worked successively in all branches of the service.

Commercial telegraphy, and radio telegraphy offer excellent opportunities to those who have a bent for electrical work; while railroad telegraphy opens up a wide field of action for those who have a liking for station work and train operation. In the cable service, while operators' salaries are high, the opportunities for advancement are somewhat limited

TAPE RECORDERS.

L. B. W., Durmid, Virginia.—Tape recorders are no longer manufactured in this country. Second-hand machines are very rare. A good substitute, however, is an ordinary call circuit register. They can be purchased new for about twenty dollars each.

The examinations given applicants for positions as operator differ with different employing companies. Generally speaking, an applicant must be in good physical condition; able to pass the eye test; have satisfactory personal references; be a fairly good operator, and familiar with train rules. The superintendent of telegraph of the road you wish to engage with will be glad to give you the particular requirements on his road.

TELEGRAPH REPEATERS.

C. L. L., Osceola Mills, Pennsylvania.—Telegraph repeaters are used to insure good working circuits regardless of weather changes, and to avoid the necessity of using main line batteries of high voltage.

During clear weather a line with twelve offices cut in, and when the wire used is a number eight iron, well insulated at supports, may be worked two hundred miles without repeaters, by employing a battery yielding 214 volts pressure at one end of the line, or 107 volts at each end

If the length of the line is extended fifty or sixty miles the relays will require careful adjustment as the current flowing in the circuit will be considerably reduced in strength.

There are various conditions which govern the length of line which may be worked direct; that is, without intermediate repeaters. During wet weather the escape of current to earth by way of wet cross arms, poles, trees, *et cetera*, results in poorly working relays at the distant end of a line which has battery at one end only, and of relays near the middle of a line which has battery at both ends.

Where number nine copper wire is used the circuit may be about three times as long as when number eight iron is used, due to the lower electrical resistance of copper.

Wires worked directly between large offices, without intermediate offices being connected into the circuit, in many instances are from 500 to 600 miles in length. Along some Western roads, such as the Santa Fe, circuits 800 to 1,000 miles long are worked direct, due to the dry atmosphere in that part of the country, with consequent high insulation of line wires.

POLISHING FIBER-BOARD.

R. B. W., Stapleton, Staten Island.—Fiber instrument bases and switchboard panels may be given a satisfactory polish by means of fine emery paper and oil. If, before the instruments or switches are mounted upon the fiber board, same is rubbed carefully and steadily for an hour or so with a very fine grade of emery cloth, frequently saturated in oil, a very smooth surface may be obtained. After this, if the plate is applied to a felt buffer wheel a good polish may be worked up.

STANDARD OIL TELEGRAPHS.

E. L. H., Boyne City, Michigan.—Write to the Superintendent of Telegraph, Standard Oil Company, Oil City, Pennsylvania, for particulars of the present situation regarding vacancies in the telegraph service of that company.

The company employs only a limited number of telegraphers.

OPERATORS AND TOWERMEN.

J. J. H., Pittsburgh, Pennsylvania.—The N. Y., N. H. & H. Railway Company have at the present time, vacancies for both towermen and telegraphers

Apply to Mr W H. Foster, New York, New Haven, and Hartford Railway Company, 132d Street and Willis Avenue, New York City.

AMATEUR WIRELESS.

R. J. S., Ravenna, Kentucky.—There are three steps which should be taken in studying radio telegraphy. First, connect two cells of dry battery, an inexpensive buzzer (or vibrating bell, with the gong and tapper re-

moved), an ordinary telegraph key, and a telephone receiver. The two wires attached to the telephone receiver terminals should be connected to the terminals of the battery.

Connect the key and buzzer in series; the other terminal of the key, and the other terminal of the buzzer are then connected to the terminals of the battery, to which the telephone receiver already has been connected. When the key is operated in forming the dot and dash code the signals as heard in the telephone receiver closely resemble regulation radio signals.

When the code has been mastered by means of the above arrangement, the student should erect an aerial wire for receiving radio signals sent from nearby government, commercial, or amateur stations. The type of aerial structure required depends upon the proximity of neighboring stations.

If there is a station within five or ten miles, a single wire 100 feet long, elevated about forty feet above the earth, and well insulated, will answer. If there is no station closer than one hundred miles it will be necessary to erect a four-wire aerial

The receiving apparatus consists of a detector, pair of 1,000 ohm telephone receivers, condensers, and tuning coil; all of which may be purchased for about $15. After the outfit is hooked up according to diagram which accompanies same, the student should be able to hear sending from neighboring stations.

Facility in copying the matter transmitted can be acquired only by practice.

The third step is to procure a transmitting-outfit, which costs about $15 for a five-mile range; longer distances proportionately.

One step at a time, however, and you shall make satisfactory progress.

Reliable radio apparatus may be purchased from the Manhattan Electric Supply Company, 17 Park Place, New York.

COMPOSITE CIRCUITS.

G. K. L., Green Bay, Wisconsin.—The equipment required for composite operation costs about $100 per circuit; exclusive of the cost of the regulation telegraph and telephone apparatus required.

TELEPHONE CIRCUITS.

W. W. H., Peoria, Illinois.—A satisfactory talking circuit may be had over a distance of 125 miles by employing a pair of No. 8 iron wires, provided the line is well maintained, and that no part of the circuit is carried in a cable

Satisfactory telephone transmission up to 500 miles may be accomplished by using a pair of No. 9 copper conductors.

For distances of 1,000 miles it is best to use a pair of No. 6 B. & S. gage copper wires.

TELEGRAPH IN ALASKA.

W. K. L., Calgary, Alberta.—The Alaskan Engineering Commission has charge of the work of building railroad lines in Alaska. The telegraph and telephone department is under the management of Mr. E. R. McFarland, who may be addressed at Anchorage, Alaska.

QRW QRY.

F. C. J., Brooklyn, New York.—The code abbreviation QRW signifies "Are you ready?" and the letters QRY signify "When will be my turn?"

CONVENTION BY TELEPHONE.

G. H. S., St. Louis, Missouri.—The members of the American Institute of Electrical Engineers: 1,100 in New York; 1,000 in Chicago; 700 in San Francisco; 600 in Atlanta; 500 in Boston; 600 in Philadelphia, and 50 in Salt Lake City held their annual convention by telephone May 16th last.

The President of the Institute, in New York, presided over the meeting.

The members did not journey to New York to attend the meeting. All members assembled in the various cities named above were provided with telephone receivers and listened to the speakers scheduled to conduct the meeting. An address was given by a member in San Francisco, and the members in that city as well as in New York and the other cities mentioned heard what was said. A member in Atlanta, Georgia, made an address, and the members assembled in that city as well as in San Francisco and the other cities mentioned heard what was said. As each speaker finished, the applause was instantaneous in all of the cities, and was as realistic as if the 6,000 members were gathered in one room.

A member in San Francisco submitted a resolution. A member in Boston, after hearing the resolution read by telephone, offered an amendment thereto. The originator of the resolution, in San Francisco, accepted the amendment. A member in Atlanta seconded the adoption of the resolution; whereupon, the President, in New York, submitted the question to the entire telephone audience for action. The 'ayes' and 'nays' as called for were plainly audible to all members assembled in the various cities.

The Sunny Side of the Track

A MAN who is constantly traveling over the same railroad has become well acquainted with the porters of the sleeping-cars.

On a recent trip he hailed his porter exuberantly, and said:

"Hellow, Matthew! I have some good news for you. We've had a birth in our family since I saw you—twins."

Matthew grinned.

"Well, sir," he said, "I wouldn't call that a birth, sir. That is a section, sir."—*The Maine.*

A New Yorker, who recently returned from a visit to Boston, vouches for the truth of the following: One afternoon he found the six-year-old son of his host settled in front of the drawing-room fire with a sheet of paper before him and a pencil clasped in his chubby fist. Stealing a look over the boy's shoulder, he saw that the little fellow was making pictures.

"Well, Bobby," he asked genially, "are you drawing an engine?"

Slowly the child looked up and slowly he spoke:

"It would take a very strong boy to draw an engine; but I am making a picture of a locomotive."—*Youth's Companion*

THE lanky youth who occupied a seat in a passenger coach persisted in sticking his head and shoulders out of the window. The brakeman was passing through the coach and he touched the youth on the back.

"Better keep your head inside the window"

"I kin look out the winder if I want to," answered the youth.

"I know you can," warned the brakeman "But if you damage any of the ironwork of the bridges, you'll have to pay for it."—*Railroad Men*

PAT: "I can't hear what you are saying."

"Well, then, repeat what you didn't hear, and I will tell it to you again."—*Thomas D. Lockwood*

"IT is 'plane' that I love you," he began.

"Is that on the 'level'?" she asked

"Haven't I always been on the 'square' with you?" he urged.

"But you have many 'vices,'" she remonstrated

"Not a 'bit' of it," he asserted

"What made you 'brace' up?" she queried coquettishly.

"The fact that I 'saw' you," he replied with a bow.

"I ought to 'hammer' you for that," she answered saucily

"Come and sit by me on the 'bench,'" he urged

"Suppose the others should 'file' in?" she murmured.

"You shouldn't let your arms 'compass' me," she continued.

"I know a preacher who is a good 'joiner,'" he suggested.

"Promise not to 'chisel' him out of his fee," she requested.

"That wouldn't 'augur' well for us," he answered.

"Shall I wear the 'blue print'?" she asked, as they started for the license.—*Pattern Makers' Journal.*

"REMEMBER, my son," said the father, "that politeness costs nothing"

"Oh, I don't know," returned his hopeful. "Did you ever try putting 'Very respectfully yours' at the end of a telegram?"—*The Ladies' Home Journal.*

AS a train stopped at a little Ohio station the passengers heard the plaintive bawling of a calf, which was being wheeled along the platform in a crate.

"There's some one complaining, conductor," said a traveler, looking for a bit of fun.

"Not to me," answered the mild old ticket-taker. "Never heard a passenger's complaint with that much sense."—*The Express Gazette.*

SOME years ago a little mountain girl of six was taken to the roundhouse at Sacramento, California, for her first sight of an engine. For some moments she watched the huge mountain "Jumbos" switching back and forth to reach their proper tracks; then she remarked with a fine air of finality:

"No wonder those things can go so fast—they practise enough."—*Harper's Magazine.*

THE picture showed a bevy of shapely girls disrobing by the "old swimming pool" for a plunge. They had just taken off shoes, hats, and coats, and were beginning on— A passing freight-train obscures the view. The next picture shows them in the water.

An old railroader sat through the show again and again.

Finally a friend tapped him on the shoulder and said:

"Aren't you ever going home?"

"Oh, I'll wait a while," was the answer. "One of these days that train is going to be late."—*The Right Way.*

"BOBBY," said the lady in the street-car severely, "why don't you get up and give your seat to your father; doesn't it pain you to see him reaching for a strap?"

"Not in the street-car," replied Bobby cheerily, "but it does at home."—*New York Railways Employees' Magazine.*

THE visitor was being shown about by the head of the up-to-date railroad freight-office.

"Who is that dapper youth at the glass-topped desk?" he asked.

"That is the superintendent of the card-index system. He keeps an index showing where the index cases are."

"Who is the young man with the gray gaiters and the efficient ears?"

"He keeps an index showing the length of time it takes to index the indexes."

"Who is the girl with the golden hair?"

"She decides under what index an index to the index of the filing-cabinets shall be placed."

"And who is the gray-haired man at the disordered desk in the corner?"

"Oh, that's old Joggs. He doesn't fit in very well with the rest of the office, but I have to keep him around. He's the only employee who can find important papers when I want them in a hurry."—*New York Mail.*

"DO you believe everything you hear?"

"No, but when I come to a railroad crossing and hear a whistle, I never doubt that a train is coming."—*Detroit Free Press.*

"WHAT is Bluggin's grievance against the railroad company?"

"He has two grievances. One is that some of the trains don't stop at his station, and the other that after he gets aboard, the train loses time by stopping at other stations."—*Washington Star.*

AN important-looking and haughtily acting young man was wandering up and down on the platform of the railroad station of a small Western City. He was intent on finding an empty seat in the express, which was almost due to start. Vainly did he search each car.

Suddenly he assumed an official air, and, walking up to the last car, he cried out:

"All change! This car will be left here."

The occupants of the crowded car uttered exclamations which proved their dissatisfaction, but hurried out and packed themselves in other coaches. The face of the young man assumed a bland and childlike expression as he settled himself very comfortably in an empty seat.

Shortly after the station-agent put his head in at the door and said:

"I suppose you're the smart boob who told the folks this car wasn't going, aren't you?"

"Yes," replied the bright youth, with a grin.

"Well," responded the station-agent, "you were right. It isn't. The brakeman heard you calling out about it, and so he uncoupled it. He thought you were an official."—*Lippincott's Magazine.*

A LADY stepped from the express at a way-station on a special stop order. To the only man in sight she asked:

"When is the train for Madison due here, please?"

"The train went an hour ago, ma'am; the next one is to-morrow at eight o'clock."

The lady, in perplexity, then asked:

"Where is the nearest hotel?"

"There is no hotel here at all," replied the man.

"What shall I do?" asked the lady. "Where shall I spend the night?"

"I guess you'll have to stay all night with the station-agent," was the reply.

"Sir!" flashed up the lady. "I'd have you know I'm a lady."

"Well," said the man as he strode off, "so is the station-agent."—*Things Technical.*

THE man struck a match to see if the gasoline-tank on his automobile was empty.

It wasn't.—*Cincinnati Enquirer.*

THE man speeded up to see if he couldn't beat the train to the crossing.

He couldn't.—*Columbia State.*

THE man set the alarm clock to see if he could beat his wife to his trouser pockets.

He didn't.—*Springfield* (Mass.) *Union.*

THE man looked down the barrel of his gun and pulled the trigger to see if it was empty.

It wasn't.—*Charlotte News.*

THE man asked the girl to marry him to see if she was engaged.

She wasn't.—*Nashville Banner.*

THE man blew out the gas to see if the asphyxiation tales were jokes.

They were not.—*Memphis Commercial Appeal.*

TALES BY JONES THE BOOMER.

BY J. W. EARP.

As Local Chairman for the Triple-Links, He Has a Chance to Put a Few Over on the Super.

PRESIDENT WILSON, of B. R. T. No. 000, was in despair. The lodge was trying to elect a local chairman, without results as yet because of the fact that as soon as one man's name was proposed for the office that man made haste to make known the fact that he could not accept the position. The fact remained that while each and every man was willing to lay down his life for the organization, not one of them was willing to accept the responsibilities the position entailed. They were all of the same mind as the sad-eyed switchman who said:

"I'd rather face a Gatling gun than Old Man Reade."

"So would I, matie," said another switchman.

And all of the other members seemed to be of the same mind. It looked as if the "Triple Link" lodge would have to do without a local chairman, when the outer guard addressed the president:

"Brother Jones is at the door."

"Admit Brother Jones," said the president.

"Just a moment!" shouted the secretary, jumping to his feet and motioning the guard to stand still. Then, turning to the crowd, he said:

"It seems that we cannot get a local chairman from the members present this afternoon, so I make a motion we present it to Brother Jones. Now, that Brother Jones will have the proper respect for the place, we will make it appear to be a coveted position. Brothers Wink and Simpson will be rival candidates for honors in a mock election which will be voted on three times. And each time the vote will be declared a tie.

"Then Brother Hennesy will nominate Jones as a 'splitter' so as to break the deadlock. Gentlemen, do I make my plan clear to you all?"

"You bet!" exclaimed the men, with many a laugh.

The secretary turned to the outer guard and with exaggerated politeness said:

"You may now admit Brother Jones."

The election was in full swing when the Boomer entered the room. Seating himself between the sad-eyed switchman and the student, he nodded to the student, saying at the same time:

"Put King George and a bolt of cloth on my table, and watch me make him a dress suit."

The student passed the paper and tobacco. For the next few moments the Boomer was busy tailoring a "suit" for King George.

The election was growing stormy. The members entered into the spirit of the game with a will, and the noise they created led the Boomer to remark:

"Just like it used to be on the old G. H. and S. A. when we held elections. The last election we held took a doctor, a lawyer, six policemen, and four trips of the two patrol-wagons before the judges could count the votes."

"Gentlemen!" It was the voice of the president speaking. "Three times have the ballots been cast, and three times has the result been a tie. We do not care to remain here all night, at least I do not. I am open for suggestions." And he winked.

"I nominate Brother Jones, so as to break the tie," said Hennesy.

"Second the nomination," said Wilson.

Before the Boomer could protest the secretary was putting it to a vote. And the Boomer ruined a perfectly good cigarette when the president announced that the vote was practically unanimous in favor of Brother Jones.

It was exactly 3 P.M. Thursday when the Boomer slid by the clerk and headed for the superintendent's desk. His pocket bulged with numerous papers that were to be acted upon, and his authority was in his hand when he wound up at the desk of the official.

The clerk favored him with a scowl which the Boomer returned with interest.

"Mr. Reade," stated the Boomer, with ready tongue, as the man at the desk looked up, "I have been elected local chairman for the Triple Linkers, and I've got a pile of stuff to go over with you."

"Sit down," said Reade, indicating a chair at the end of the desk. "Now, what is on your mind?"

"Everything," answered the Boomer, seating himself; and, bringing forth a package of cigarettes, he selected one.

"Do you know it is against the rules of the company to smoke cigarettes?" asked the official, pointing to the package in the Boomer's hand.

"Gwan!" snorted the Boomer. "These ain't cigarettes. They're a combination of horses' hoofs, old rubber boots, and dead cheese. I roll my own pills as a rule, but since I've been elected to the office of grievance man the boys seem to think I ought to show a little more class than usual. Will you have one."

"I do not smoke," rebuked the superintendent as the Boomer touched a match to the pill.

"I am afraid I won't be able to, if I pace with these things very much," grunted the Boomer as he took a deep whiff.

Then he turned the box up and looked at the label with a critical eye.

"'Save the coupons; they are valuable,'" he read aloud. "Sure are. One is a trip to Dopeyland. Twenty buys a coffin with a pass to the Pearly Great Beyond. Yours truly, The Killem Quick Company."

"You came on business," insinuated the official.

"Sure," said the Boomer, dragging forth from his pocket a bundle of papers and hitching his chair closer to his chief's. "Now, here in this case of Mike Hennesy"—taking the top paper from the package and placing it before Reade. "Mike claims that he was pulled off of a regular car on the 15th inst., whatever that is, to do emergency work. While he was off his car made six hundred miles while he only made two hundred. He turned in a time-slip, which was turned down with no reasons on it as to why he should not be allowed the difference in miles. Now, Section 54, Article 9, says—"

"I know what it says," nodded Reade; "but you must remember that the emergency work that Mike did was conductor's pay."

"Of course," agreed the Boomer. "But he wants the difference in brakeman's pay. He told me to try to get the four hundred miles, and if I couldn't get that to take two hundred miles; if you refused to pay that, why, to take one hundred. Even if I am a Yankee, I won't haggle over it, so if you will make it an even one hundred and ten miles I'll call it square. When I go down stairs again I will see if I can borrow the section foreman's crowbar, whether he is willing or not—"

"What on earth do you want with a crowbar?" asked Reade, a look of surprise on his face.

"So I can pry that extra five cents

out of Mike to buy me a can of real tobacco with. Believe me! Mike's middle name, 'Tight,' just fits him right. Far be it from me to say that Mike was stingy; I figure he is just economical. I'll bet that when he spends a nickel he expects the band to play and the people cheer him for his generosity."

Reade threw back his head and laughed heartily. At the sound every man in the office looked up in amazement, because as a rule the visit of the local chairman was punctuated with strong and vigorous language.

Taking advantage of the laugh, Jones picked another paper from the bundle beside him.

"So Mike is stingy, eh?" laughed the official as he signed the paper.

"Stingy is no name for it," asserted the Boomer, slipping the second paper on the desk for the perusal of the still laughing super.

"The only man that ever had anything on Mike," he continued, "was a guy that used to live in my home town. This guy's name was Lambert, and he was so stingy he used to jump over the gates to keep from wearing out the hinges. But as stingy as this Lambert was, put him up alongside old Sam Titus that I broke partners with over on the Sante Fe and he resembled a spendthrift."

The Boomer paused to relight his cigarette.

Reade, with his thoughts still on the tale of the stingy man, absent-mindedly signed the paper before him; it provided for the reinstatement of one Pat Doyle, who Reade had said should never work again on the division as long as he, Reade, was superintendent.

The Boomer gasped when he saw the one that had been signed. With a hasty movement he put it underneath the pile. At the same time he shoved the duplicate copy over to Reade, and continued the tale.

"Yes, sir; old Sam was as big a tightwad as you could find in seven States. He was so stingy that he would make the fireboy burn three extra tons of coal each trip making the extra moves to save him shoe-leather.

"He didn't have any bad habits, because he was so stingy he couldn't afford to. The only thing that Sam did was to play solitaire with an imaginary gambling-house. In his mind he would buy the deck for one hundred and four dollars, and for every card he put up he got back ten dollars. I could always tell how the game was going by the language that Sam used."

Again the pause came for the Boomer to relight his cigarette and place another paper before Reade. This paper provided for the reinstatement of a worthy brother, Tim Murphy by name, whose fistic as well as wordy altercation with the yardmaster almost ruined the features of the latter. Tim was on the blacklist as a result of the argument.

"So he couldn't beat Sol, eh?"

Reade was enjoying the tale the Boomer was unfolding, and, not wanting to miss the rest of it, signed the paper and passed the original to the local chairman.

"That's what I was going to tell you," returned the local chairman as he possessed himself of the paper and resumed his tale. "Mike use to make more fuss over dropping a mind-bet to Sol than I did when I would drop my whole month's check in a little friendly game with the boys.

"Many's the night I've spent in a caboose trying to make two pair beat three of a kind, and when morning came I was firmly convinced of the fact that it can't be done.

"When spring rolls round Sam is in Sol's debt about fifty thousand dollars, which worries him considerable. I watch him mooning around and am afraid he's going dippy. But nothing of the kind in Sam's case. He is just figuring out how he can trim old Sol and break even. And what does that guy do but buy a brace deck—you know the kind I mean—those little I-know-the-backs-better-

than-you do-the-faces slippers—and goes against Sol again.

"Say! When he slips the brace deck in on Sol it is clean-up day with a walk-away for Sam. When I left the car the last day in April Sam has Sol owing him something like seventy-five thousand dollars, and the prospeces are good for twice that much.

"I'll bet if Sam could collect his mind-bets at the present time he'd have Rockefeller looking like a queen-jack high run in a stud-game. But I never did think much of a guy that will run in a skin game on a dummy. Do you?"

"I should say not," emphatically declared Reade.

The Boomer glanced at another paper, picked it up, and began again.

"This document states that John Sheehan was handed a package of 'brownies' because of short-flagging when the trainmaster sprung a test on them the night of the 14th of February. If you could see John's face and body you'd know why he didn't hit the ground on time.

"Why, when that slaughterer of the compressed air wipes the hands off the air-gage in the cab, he almost commits indirect murder back in the dog-house. Of course I know they are supposed to stop at once when they hit one torpedo like that; but let 'em use a little judgment.

"There's no use in trying to bankrupt the B. R. T. lodge or in working a hardship on the poor widows and orphans that hold stock in these accident insurance companies, by beating them out of their dividends just because the trainmaster wants to spring a test.

"Two seconds after the hoghead delivers his solar-plexus blow to the air-gage Johnny throws his red light through the cupola and ruins a five-dollar derby along with the conductor's disposition, when he hangs the red bug over the noodle of his superior officer. Johnny can't stand many more brownies on his record sheet; that's why I want you to give the kid a show.

"He is all bandaged up with rubber tape on account of him misplacing his floating ribs when he collides with the cupola steps. I was over to his house the other night, and we had the time of our lives in taking off the strips. Mustard-plasters are postage-stamps compared with this adhesive tape the doctors use for first aid. Every time I give a pull John gives a yell—"

"He cannot be as bad as that. He is working every day."

"You would, too, if you had three kids and a wife looking for you to bring in the bread and butter so they can chew proper. You must remember Johnny has nothing but a job shacking."

"Oh, well!"

This last in a tone of resignation as he signed the paper.

"What else?"

"This one of Tommy Alexander's case. You pulled him out of service for not showing up the night the test was pulled off on Sheehan. Now, how on earth could he show up when he was having the time of his life to keep from being killed?"

"How is that?"

"Well, you see it is like this: When that promoted coal-heaver they dignifies by the name of hoghead draws the wind from the pig by kicking her in the diaphragh, Johnny does stunts in the caboose. Tommy, his partner on the head end, is having plenty of troubles of his own. He told me he did the high dive, loop the loop, and slide-for-life act along those cars something fierce until he meets up with a car that has the ventilators open and let him drop into the car.

"Now, this car is full of those wild mountain-goats from the hills of Wyoming, and the way they welcome Tommy to their domicil isn't good to hear; what they did to him was much; what they didn't do isn't worth mentioning.

"He told me they played three games of basketball with him and are just starting in on the fourth when one of the goats fouled on a basket-throw and

shoots him back up through the ventilator.

"He says that every time one of those goats hit him it was like the kick of an Alabama mule. He'd sail up to the car-roof, and when he'd come down some other goat would hit him in his seating capacity and start him again on his aeroplane trip.

"The worst of it was they never let him touch the floor on his downward trip, but would jump up and meet him in mid air. Tommy said the shock to his nervous system was something awful to even contemplate at the present time."

"I did not know about it," said Reade with a choking sound as if he wanted to laugh aloud.

Tommy Alexander was reinstated in one flourish of the pen.

"Thanks," grinned the Boomer. "Now about this case of Matt Donovan's. Do you know that every time I look at this bunch of papers it reminds me of roll-call at a meeting of the Ancient Order of Hibernians?"

"I refuse to consider his case at all," snapped Reade. "His manner was very insulting when the investigation was held."

"Ah, he gets it honest. That came from his mother's side. I knew his father when he made his stake in oil stocks. Mike was a good plug, but his wife had the society fever and tries to put a dent in the armor plate of K. C.'s society when Mike gets a pile of coin rolled up in the bank. She would have made it, but Mike has to crab the game the night of the old lady's début.

"They were at lunch when Mike starts the conversation toward strength. He relates a few of his feats of lifting, and then tops the climax when he takes off his coat and says:

"'I'll bet any man five hundred dollars I can lift the pinanny with one hand.'

"The party broke up right then. I saw Mike here about a week ago. He says:

"'Do ye know me boy, Matt?'

"I tells him I do, and he says:

"'Some boy, Matt! I saw him the other day, so big and fine he stood by the cars. And would you believe me, one wave of the hands and the box car moved for him'

"But Matt is a good scout. Give him a show for his alley, won't you?"

Reade eyed the Boomer steadily for a moment, then growled:

"Give me the paper."

"Thanks. Here is Tim Connors that got fired for not reading orders the night that Chub Willmood overlooks his hand and meets No. 84 on the main line."

"We will pass his case up. He should have read the orders and known the contents, thereby saving us a lot of money."

"Aw, now, super! Don't be hard on the boy. He has been having pretty hard sledding since he got let out. The stork arrived at his house last week with twins. Can you imagine twins? Tim is as proud as a peacock over them, but at the same time he is a mite worried as to how he is going to feed those mouths later on. You ought to see them babies in the little basket that Tim made for them, while their mother sits and rocks the cradle with her foot and makes extra clothes.

"You see, they weren't expecting a regiment to arrive, consequently they are a little short on the necessaries. At that, though, if it wasn't for the butchers, bakers, and the landlord Tim would be out in the cold street starving to death."

"I'm sorry—" began Reade.

The Boomer went on with his narrative.

"I was over to Tim's house the other night. Did you ever see his wife, Mr. Reade? A little slip of an Irish colleen, whose fighting weight is about eighty pounds; eyes as blue as the skies of Killarney; hair as black as the peat-bogs of her native State; and a complexion like the strawberries and cream you get at the farmhouses in Missouri.

"For size and weight she's in the featherweight class. But for pure grit

she has Jess Willard looking like a branch line teakettle alongside a Mikado-class engine.

"She says to me:

"'Soon as I am able I'm going to take in washing. That will keep us going and help pay some of the bills we owe.'

"I looks at Tim when she passes the washing stunt to me; he buries his head in the basket where the babies are, and says:

"'Not if I have to take a club and go out and get our living from the alley some dark night.'

"Tim's tried to get work, but biz is slack right now. If you'd put Tim back to work, Mrs. Tim would be the happiest woman this side of the Mississippi."

"Confound you, anyway!" said Reade, blowing his nose with a great deal of noise. "Give me that paper, and be quick about it before I change my mind. Here"—tossing the paper back to the Boomer—"did you ever hear of a fellow named Baron Münchhausen?"

"Sure!" replied Jones, tucking the paper away. "Barry and I used to brake partners together over on the old Santa Fe in '92.

"I never will forget the day we were making a flying switch with a car of Western horses, and he bends the rails between the wheels. The car turns over on its side, knocking the roof off. The horses seem to think it is unloading time, because they walk right out and over yours truly.

"When the parade is over I am ten minutes overdue at a hospital, and Barry is scared to death. But I had one swell time at the hospital.

"The swellest skirt is my nurse, and I fall for her like a ton of brick. Sure! Love at first sight for both of us. I was going to tie up with her, but the head nurse slips me info that she has been vaccinated three times with the matrimonial virus and couldn't get it to take. I was a good gambler in those days, but I figure that a dame that has three shots at the marriage game isn't entitled to any more chances in the lottery. So one day I went for a stroll and never came back.

"But Barry was a good scout—"

"You are a better one, though," smiled Reade, looking at his watch.

The Boomer took the hint, and placed the last of the papers before him with a sigh of relief.

"Here is a statement from Henry Ford in regard to the accident that happened on the 14th inst., whatever that is. He says the gentleman in lower four is mistaken when he says that the flagman kicked him in the stomach on purpose the night that No. 55 split a switch at Baxico. Henry says here the porter was the guilty man and that when he was trying to find his sea-legs and get settled the porter hops out of bed and sideswipes the old gent with a No. 10 pedal extremity. It was an accident all around, and Henry says he considers the reprimand unjust."

"I'll kill that charge, then. Is that all?"

"Yep; that's all. So I'll be blowing out right away and let you go home. Have one of old Killem Quick's Cemetery Specials?"

"No, thanks, Mr. Jones. Good day!"

"So-long," returned the Boomer, making for the door.

When the door closed on the broad back of the Boomer, Reade shuffled the papers in his hand and gave them the once-over before placing them in his desk. His eyes fell on the one that provided for the reinstatement of Pat Doyle, and he muttered something under his breath. But when he met up with the one that provided for the same treatment of Tim Connor he spoke out aloud.

"Beg pardon. Speaking to me, sir?" asked the clerk, whose name was Demmit.

"No — that is — er — yes — I don't know. Say, Demmit, how close to Tim Connor do you live?"

"Next door, sir."

"I heard that Tim was the father of twins. Is that true?"

"I'm afraid that some one distorted the truth, sir. Tim's prize bench-legged bull has two of the finest puppies you ever laid eyes on; but as for babies at Tim's house, there isn't any. My wife told me there weren't even any prospects of any, sir."

"Thank you, Demmit," said the official, dismissing the clerk with a wave of the hand.

"Don't mention it, sir."

The last reddish-tinted rays of the setting sun crept through the window and nestled caressingly on the desk and in the pigeonholes of the file-cabinets. The whistle of the roundhouse caused a mighty army of men to pour out through the great gates like children from the school-room. The day's work had finally ended.

Reade looked at the papers in his hand and then to the laughing army wending their way up the path to their homes. Somehow the world seemed brighter than it did, and he was glad that he was alive.

"It is a great game," he confided to the papers in his hand. "And to think I let him pull that sympathy stunt and get away with it! But"—a tender light beamed in his eyes for just a moment and he wiped away a sentimental tear—"there has to be some one to encourage them. Besides"—he brought his fist down on the desk "I was one of those boys myself once, and I understand just how it is."

He closed the desk softly and repeated the phrase:

"It is a great game—a great game."

YOU WITH THER FOOLISH CLOTHES.

BY JACK HYATT, JR.

YOU with ther foolish clothes—
Take 'em off!
Ther jester of old
Says:
"They show good form
But
Bad taste."
He knows!
Can't yer call yer mind
Yer own
Fer a minute?
No!
Ye're afraid
'F public 'pinion,
'N'
Dassn't
Wear what yer wanter—
Yer boob!—
'N' be comfortable.
You with ther foolish clothes—
Take 'em off!

A CLASS RECEIVING INSTRUCTION IN AIR-BRAKE WORK THE PHOTOGRAPH WAS TAKEN AT CHICAGO, ABOARD ONE OF THE TRAVELING INSTRUCTION-CARS. RANGED ON EACH SIDE OF THE MEN ARE AIR BRAKES ENOUGH TO EQUIP A 32-CAR TRAIN, WITH 36 FEET OF PIPE-LINE BETWEEN EACH BRAKE, A 10-CAR AIR-SIGNAL A 9½-INCH WESTINGHOUSE PUMP, AND ALL THE SECTIONAL VALVES OF BOTH THE WESTINGHOUSE AND THE NEW YORK AIR BRAKE SYSTEMS

R. R. EDUCATION ON WHEELS.

Air-Brake Is Demonstrated by Rolling Schoolrooms Which Contain Enough Equipment to Control a 32-Car Train.

BY FRANK M. O'BRIEN.

"EXACTLY how," said the young fireman to the old engineer, "does the air-brake brake?"

"I can't show you exactly," said the old engineer, "because I never could think of a way to be alongside the wheels of thirty or forty freight-cars all at the same time. And I guess that's the only way you could see exactly how it brakes.

"I can tell you this, though. You can stop a train with the air, or you can pile up a train with it. Which you do makes quite a difference to the superintendent."

The air-brake is one of the mysteries of railroading, although not the only one. There are a hundred other things which puzzle the novice and which the veteran cannot always explain. And nowadays firemen are always asking, "Why?"

Years ago the railroads and their employees were content to take things slowly. Now the roads want trained men who are still young.

Roads Want Their Help Trained.

A thousand American railroads employ two million men, who support one-twentieth of the whole population, but these railroads have not been able, until recently, to send their ambitious employees to any but the school of experience.

Yet the ambition is there, and must be fed, and the railroads, so far as they are able, are doing their part to make their men and women ready for promotion. That is why the late James J. Hill gave $125,000 for a professorship of railroading at Harvard. That is why 250 American railroads have entered into contract with the International Correspondence Schools at Scranton, Pennsylvania, for the instruction of their employees in railroad operation.

Evidence that up-to-date railroads are keen to help their men to advance was brought out in 1898, the first year that the Scranton schools added railroad subjects to their curriculum. A car to advertise the innovation was sent out, and when it was in Canada Sir William Tate, of the Canadian Pacific, saw it. He got the point at once.

"That looks like a good idea," he said. "Why don't you send it over our entire system?"

Third of U. S. Mileage Is Represented.

Of course, the advertisers were delighted to adopt the suggestion. To-day the biggest roads in Canada have contracts with the Scranton schools for the education of their employees.

The example of the Canadian Pacific was quickly followed in the United States. In the list of 250 roads on the school roster are the Santa Fe, the Omaha, the Lackawanna, the New Haven, the Southern Pacific, the Missouri Pacific, the Baltimore and Ohio, the Boston and Maine, the Missouri, Kansas and Texas, the Seaboard Air Line, the Texas and Pacific, the Alton, and the Denver and Rio Grande. A map of the lines that help

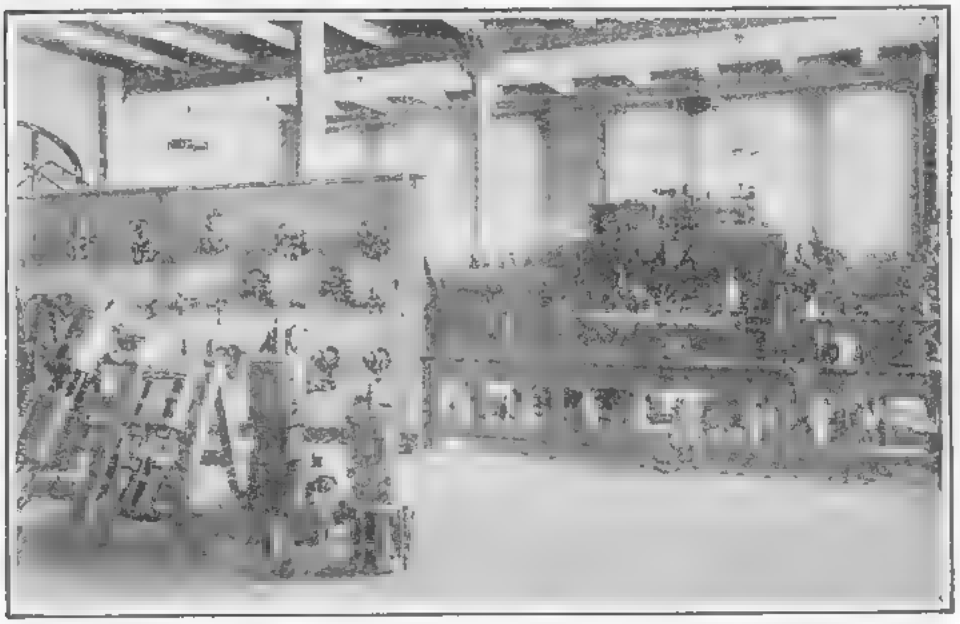
their men to "learn by mail" would make a network of such fine mesh that, if printed on a page like this, it would be a mere blur. A third of the country's mileage is represented.

The interest of the railroad men higher up is not perfunctory. Many of them have themselves profited by correspondence schooling, and they realize what benefits it gives to a man who really wants to go ahead. This year, when the St. Louis and San Francisco wanted a new general manager, it found one in E. D. Levy, a man who had taken two courses — stenography and mechanical engineering — from the correspondence school.

E. D. LEVY, NOW GENERAL MANAGER OF THE ST. LOUIS AND SAN FRANCISCO LINES, WAS HELPED ALONG THE UPWARD WAY BY THE SCRANTON SCHOOLS.

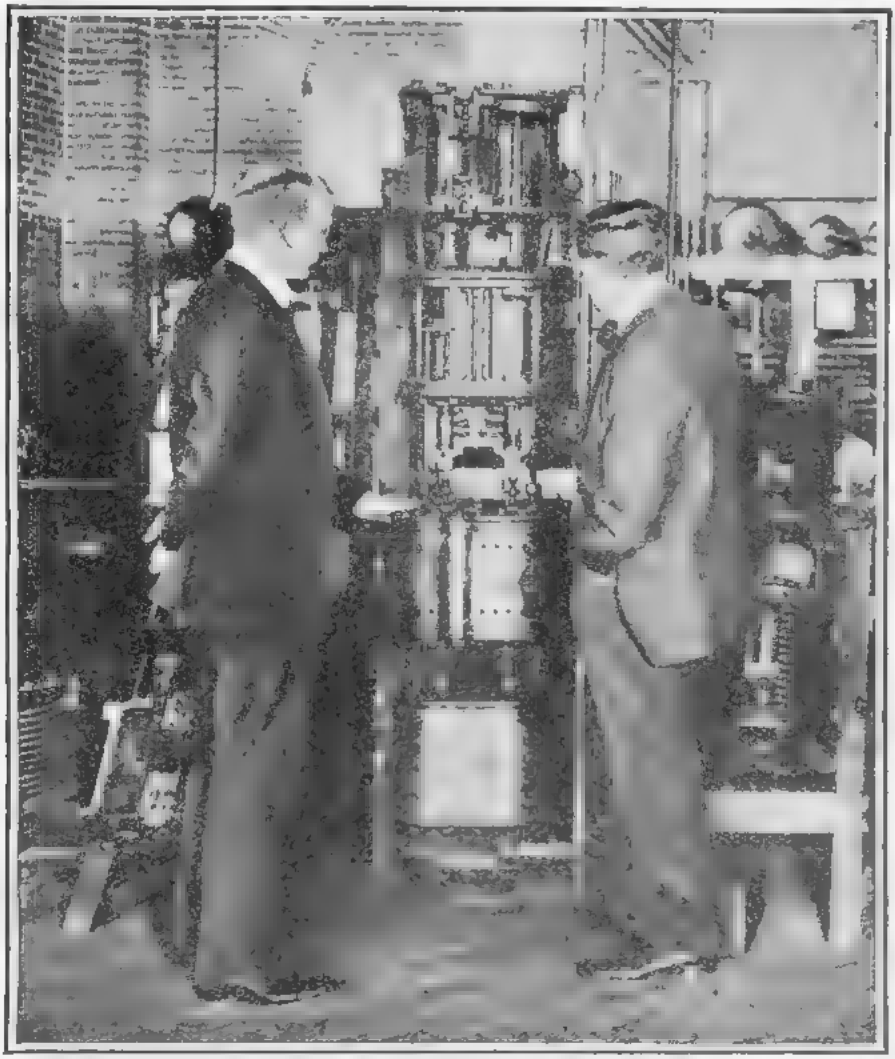
The men who run the roads are keener about the progress of their young men than they used to be. In fact, so many of them insisted on getting information relative to the students that the Scranton schools found it wise to send monthly reports to the officials of each road with which it does business.

As there are 160,000 students taking the course in locomotive-running alone, the size of the job may be imagined, but the schools have a well-oiled system. The



THE SCHOOLS' MODEL-ROOMS CONTAIN EQUIPMENT WHICH HAS BEEN CALLED THE MOST INTERESTING MECHANICAL ASSEMBLAGE IN AMERICA — IN THIS CORNER ARE PLACED SECTIONAL MODELS OF AIR-PUMPS, LUBRICATORS, INJECTORS, AND OTHER LOCOMOTIVE APPLIANCES.

superintendent of the X. and Y., at Smithburg, Arizona, knows that Edward Doe, machinist's helper, has passed his examination on gear-teeth profile with a percentage of 96.5. And when young Mr. Doe passes his paper on bench-vise details the boss will know that, too.



IF YOU ASKED ONE OF THESE MEN EXACTLY WHAT HE IS DOING HE WOULD REPLY THAT THE OPERATIVE AIR-COMPRESSOR HAD BEEN PLACED IN TANDEM WITH THE SECTIONAL COMPRESSOR TO TEACH THE OPERATION OF AIR-COMPRESSORS —WHICH WOULD BE COMPRESSED INFORMATION INDEED

Real Railroaders All Keen Students.

So it is a triangle game, in which the railroads play the easiest part. Is it a hard game for the employee-student? Not if he is interested

Of course, unless his mind is made up to get ahead, it would be drudgery to try to learn railroading by mail. But these men who are paying for an education have their minds made up before they decide to spend time and money.

The hammer-boy who is studying arithmetic as a preliminary to a technical course; the roundhouse wiper who wants

to be a fireman; the fireman who wants to be an engineer quickly; the engineer who wants to keep abreast of the very latest improvements in locomotives and equipment—these men are in earnest.

These men expect to be in the railroad business all their lives. It is the only business they know or think about. Perhaps only 88 per cent of them want to be president of the road, but 100 per cent of the good ones want to be something better than they are.

But, you say—and the question is natural—if an engineer can't tell a fireman exactly how air-brakes work, how is a fireman going to learn by mail?

In the first place, the lessons given by the schools are couched in language even simpler than the engineer would use.

In the second place, the unseen parts of the mechanism are illustrated by colored charts which make plain what the engineer could neither draw nor describe.

In the third place, it happens that railroading is one subject which the Scranton schools supplement with a method other than the printed word.

For the demonstration of certain mechanical mysteries the schools use five instruction-cars, which tour the country; they keep, also, the lecture and model rooms at Scranton.

Cars That Are Condensed Trains.

The five cars, manned by instructors who are expert railroad men, are moved about the country on a schedule which permits them to aid the student-employees of all the railroads with which the schools have a working agreement. The prime purpose of the cars is to make plain the most baffling of the railroad man's problems—air-brake construction and operation. Inside each car is all the air-brake mechanism that is used on trains.

Cars Nos. 102 and 103 contain a high-speed equipment, a double-header engine equipment, a 32-car train of freight-brakes with 36 feet of pipe-line between each brake, a 10-car air-signal, a 9½-inch Westinghouse pump, and all the sectional valves of both the Westinghouse and the New York air-brake systems. Lubricators, injectors, valve-motion models—everything is there to make plain to the student the why and how of the air-brake. Each car has a boiler furnishing steam to a pump which supplies compressed air for the operation of the brakes.

The three other cars—Nos. 104, 105, and 106—are similarly fitted out, except that each has a lecture room equipped with a 9½-inch pump having an extra sectional upper head working in tandem, and a ten-car air-signal apparatus showing operation under actual conditions. In these lecture rooms are exhibited stereopticon slides which show the inside of valves and things, illustrating in various colors the pressures that obtain in different chambers.

Where an Hour Is Worth a Month.

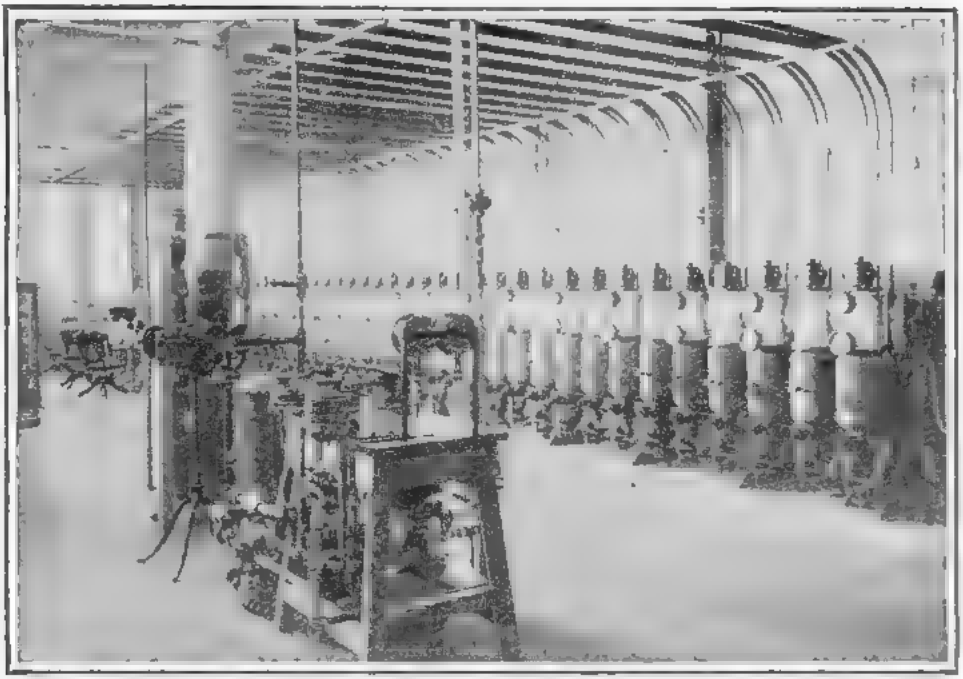
There is room in each car for thirty-six students. A man can go into the cars and learn more in an hour about actual air-brake work than he could learn in a month on the engine or at his desk.

All the secret chambers of the triple valve are unveiled to the student. He sees why, how, and when it charges the auxiliary, and applies and releases the brake. Every item of brake-operation that takes place between the engineer's valve and the rear wheels of the last car is so exhibited, in these rolling school-rooms, that the student has no guessing to do.

The instructor puts on the air suddenly, as a novice might. The student sees how this brakes the forward cars hard before the shoes are applied to the wheels of the rear cars

"That's the way," says the instructor, "to bend your train in the middle and send a car or two skyward. Don't do it that way. Do it this way."

And then, using the engineer's valve more deliberately, he makes the brake-cylinder pistons pop out all at once, braking the whole train evenly. Incidentally, this latter method is much easier



THE FREIGHT AIR BRAKE EQUIPMENT AS DEMONSTRATED IN THE HOME OFFICE WHERE THE APPARATUS CAN BE SPREAD OUT MORE THAN IS POSSIBLE IN THE RESTRICTED SPACE OF AN INSTRUCTION-CAR—ENGINE EQUIPMENT IS IN THE FOREGROUND—NOTE HOW THE PIPING, OF REGULATION LENGTH, IS CARRIED BACK AND FORTH ON THE CEILING

THE FACULTY OF ONE OF THESE RAILROAD SCHOOLS ON WHEELS HAPPENED TO BE GROUPED AROUND THE BACK PORCH WHEN THE PHOTOGRAPHER SNAPPED THEM. HOW WOULD YOU LIKE TO LIVE THE CLOISTERED LIFE AND TRAVEL FREE AT THE SAME TIME?

on the nerves of visitors. When forty pistons go "Bang!" as hard as they can, the unwarned spectator is likely to jump.

The lecture and model rooms which the International Correspondence Schools maintain in their railroad department in Scranton are even more completely equipped than the instruction-cars. They contain batteries of air-brake apparatus for 35-car freight-trains and 6-car passenger-trains, and air-signaling equipment for a train of ten cars.

The piping, carried back and forth on the ceiling, is of the regulation length. There are also live and sectional models, connected in tandem, of air-brake apparatus, with charts to explain them, and blackboards for working out lecture demonstrations and problems.

This equipment, which has been called the most interesting mechanical assemblage in America, is free for the use of students of the locomotive-running, air-brake, and other railroad scholarships. Students who wish to devote their vacation to study are welcome to go to Scranton and spend each day in these remarkable rooms.

Pupils from All Over the World.

There you will see a couple of young men from Vancouver who have crossed the continent to become a bit more intimate with the whys and wherefores of the Westinghouse and New York brakes. A student from Georgia is looking into the innards of lubricators and injectors. They might have learned from their textbooks and the instruction-cars all that was necessary to pass their examinations, but these are young men who want to be experts. Half a dozen instructors, most of them old railroad men, are there to answer every question.

Every question! Those two words are the most important in the lexicon of the correspondence school.

"When you have a hundred thousand men taking the same course," said a RAILROAD MAN'S reporter to Mr. A. E. Sweet, the general manager of the railway service division of the I. C. S., "how can you be sure that every man understands every question? Isn't it likely that one per cent — which would be a thousand students — may fail to understand?" Mr. Sweet nodded.

"That has happened," he said, "but we always know when it happens. Even if the student does not write and say so, we can tell by his answer whether he understands or not.

"And it is our business to see that he understands. The fact that 99 per cent understand does not figure. One hundred per cent must understand.

Poll-Parrots Don't Get By.

"If a student does not comprehend a question or an answer, we do not suggest, even to ourselves, that the fault is with him. The fault is with us. It is our business to make everything as clear as crystal to every one. We have been doing that for years and years. If we failed to do it we wouldn't be here."

It was suggested that it might be possible for a student to copy answers from a book and pass a poll-parrot examination.

"It is not possible," said Mr. Sweet. "Every question is so framed that the student must answer it from his mind; no set answer from a book will do. The easiest thing in the world is to discover the student who tries to copy an answer from a book without understanding. And we gently show him the error of his way."

It is said, however, that comparatively few students try the poll-parrot method. It is too much like cheating at solitaire. These men are paying to learn, and they insist upon being taught.

The ages of the men who take the courses in railroading range from twenty to sixty-five. The locomotive-running courses are intended only for engineers and firemen. Air-brake courses may be taken, however, by brake-inspectors, repair men, machinists, roundhouse foremen, and the like.

The course for trainmen and car men includes instruction in air-brake systems, train-rules, car-heating, and car-lighting. This course is taken by conductors, brakemen, and car inspectors.

The roundhouse scholarship is intended for wipers and other roundhouse employees who wish to learn boilers and boiler attachments, air-brakes, and other things that they must know before they may become firemen.

Most railroad men who go to school do so because they seek the next grade higher. The wiper wants to be a fireman, the fireman an engineer, the engineer a master mechanic. Some engineers takes courses because they are not satisfied with what experience alone has taught.

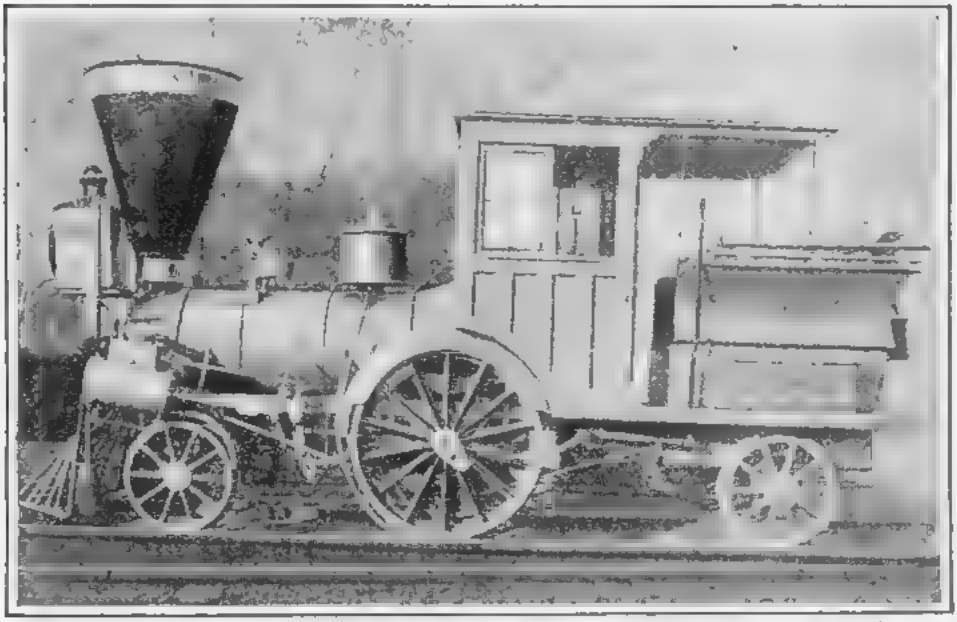
A few men find themselves forced to go to school. One engineer stamped into the I. C. S. offices, a while ago, and said.

"How much do you charge for that blanked locomotive-running course?"

When he was told, he pulled out a roll of bills and slapped the required amount on the counter.

"I'll take it," he said. "No blank-blank fireman is going to know more about the inside of my engine than I know."

"13" DIDN'T JINX THIS HOG.



QUAINT OLD GRANDDADDY ENGINE CAN STILL RUN UNDER ITS OWN STEAM.

NOTWITHSTANDING the fact that this engine bears the hoodoo number 13, it has had the good luck to arrive at a ripe old age in first-class condition. It dates back to the fifties, when it belonged to the Cumberland Valley Railroad, which is now a part of the Pennsylvania system. Although long since placed on the retiring-list, a few years ago it was taken out and run under its own steam from Chambersburg to Carlisle, Pennsylvania. Its friends say that the locomotive could repeat the feat to-day. Strictly speaking, of course, this old engine can hardly be classified with the present-day "hogs," in whose company it would rank as nothing more than a shoat; but in its youth it graded up as a grunt-emitter of enviable class and standing.

Help *for* Men Who Help Themselves

NUMBER 74.

THE STORY OF THE PASSENGER-TRAIN.

BY CLAUDE WASHINGTON.

IN FIVE PARTS. PART ONE—WHAT THE PASSENGER NEVER SEES.

YOU decide to go somewhere, anywhere, via railroad. A telephone call informs you of the various hours at which a train to your destination may be taken; a visit to the down-town office results in your possession of a more of less lengthy strip of paper miscalled a ticket; and, at the appointed hour, you stroll through the station gates, where a gateman sees to it that you have the right ticket and get upon the right platform, secure in the faith that there, at that time, will be a luxurious, speedy, safe train waiting to take you in the minimum of time to where you want to go.

Mysteries of Travel.

But how it got there, who put it there, how it comes to be clean and sanitary, inspected, made up, supplied with an engine, properly manned, what makes it leave at 11.09 and not 9.11, why it takes five hours to get to its destination and not six or four, what the causes are which make for speed, and how it is protected from danger—these are unsolved mysteries—mysteries so much a matter of course in our rush-along, every-day lives that not one traveler in a thousand senses them as mysteries at all.

Trains always were ready when you went out on the platform, trains usually do leave at odd hours and arrive in specified times, trains usually do have nice cars and a big snorter of an engine—why shouldn't they?

Why, indeed, shouldn't they? Yet behind all this obviousness lies half the romance of the least important part of railroad work, at least from the railroad's standpoint. That so much pains, labor, attention, skill, and brains are expended upon the lesser half of the railroad's reason for being—that lesser part being the passenger business—is illuminating, indeed, to him who reads as he runs as to what the actual importance of the freight end of the railroad may be.

Before one may travel it is obvious that there must be a roadbed, stations, an organization, tracks, switches, financing—a railroad, in other words. Leav-

ing to other pens and greater space the retelling of the mighty story of how the railroads as railroads come into being, let us agree that we have a railroad to travel on, and center attention only on those things which vitally concern the passenger—concern him no less that he pays them no attention, thinks of them never, even knows of them seldom or ever, until their failure brings them prominently before his mind.

Passenger Demands Five Essentials.

The vital essentials to the passenger, then, admitting the existence of the railroad as a corporation, are, in order, first, equipment on which and by which to travel; second, men to man the equipment and "make it go"; third, a scheme by which trains leave and arrive without getting in each other's way, including the protecting influence thrown about life while the men on the equipment flirt with sudden, sixty-mile-an-hour death; fourth, those things which make the traveler happy, such as sanitation, heating, lighting, comfort, and luxury; and, lastly, the "hotel features"—the Pullman, the diner, the club-car, etc.

It is along these lines that this little series of papers is to be developed, in an attempt to bring before the casual traveler a few of the hidden mysteries which contribute to that marvel which has made modern civilization a fact—the wonder of speedy transportation.

"Standard Gage" Is Derived from Horse.

Had Europe, and particularly England, been in the tropics, we might have been much more comfortable, traveled much faster and with greater safety, and paid less money for the privilege than we do to-day. It seems a far cry from a modern passenger locomotive to the beast of burden of our ancient forebears. Yet had the early Romans or the early Britons used elephants as beasts of burden, you and I would have ridden in cars much wider and more comfortable than we do to-day.

For our trains are rigidly circumscribed as to their width by the fact that, in the long ago, four feet eight and a half inches was found to be the best width between wheels for a horse-drawn cart; that a comfortable load for a horse would balance best on wheels so spaced.

As Washington Street, Boston, is supposed to be laid out on a cow-path, so our two hundred and fifty thousand miles of railroads are so wide, and no wider, because the first railroad tracks were built to accommodate horse-drawn vehicles. And as the railroads grew, and tunnels were made, cuttings run through hills, bridges given sixteen feet clearance, and dollar multiplied dollar in investment, this condition became a permanency.

To widen our present railway system or to raise the possible height of cars and engines would cost as much as making the whole system did in the first place. In other words, it isn't possible.

Can Increase Only Locomotive's Length.

Hence the astonishing things which have been done with that panting monster of steel and fire which backs slowly down the track to couple with the slightest of jars to the all-steel train into which you stroll for your journey. If an engineer had all of outdoors he wanted in which to build a thing which would go, there would be no special marvel in it.

But the locomotive designer must get his speed and his power and his weight and his ability to pull, under rigidly circumscribed conditions. He can put his wheels only just so far apart, he cannot let his boiler and his tender and his cab overhang the track but just so much, he cannot build it up in the air beyond a safe clearance for many, many bridges and tunnels.

In other words, an engine can be made bigger only in length. When the limit of possible length is reached, increase in size and power can come only from improvements within the engine itself.

These improvements date back but a few years. From the time the first en-

gine puffed its hesitating way along strap rails, running fifteen miles an hour, to the wonderment of the countryside, to 1881, improvements were all in design, in construction, in details—not in principle.

Up to that year, boiler and firebox were both circumscribed by the frame of the engine, the firebox dropping between the frame members, which in turn could be no wider than the width of the track, since it was supported by the axles between the wheels. The available width of the grate was thus but three feet.

Nine feet being the maximum distance drivers could be apart, and the firebox being between the driving axles, the grate was rigidly bounded as to size. Eighteen-inch cylinders were the largest which could be used—grate heating-surface was never larger than 1,300 square feet.

Came 1881 and Theodore N. Ely. He raised up his boiler and set it on top of his frame, increased his firebox to the extreme length a fireman could pitch coal, and produced a heating-surface of 1,800 square feet, which soon crept up to 2,500 square feet. Every one said the new machine would tip over—but it didn't.

How the Firebox Was Expanded.

The new improvement lasted until 1890, when its limit of expansion was reached. Then the Baldwin Locomotive Works stepped into the breach and the Atlantic type of locomotive came into being—the Atlantic type with the firebox back of the drivers and carried on small wheels of its own. Result, a great expansion of possible firebox and boiler and consequent steam-making and size of cylinder the limits of which have not yet been exhausted, and which will not be, say the designers, until the five-hundred-ton locomotive is a fact and not a dream.

So this monster which backs slowly down to your train is only a distant kin to that first engine which puffed on strap rails. Though both are steam engines, it is the modern monster which is only less human than the men who design it.

"And the man who runs it—the man whose pet it is—the brave engineer who lives upon it and watches jealously lest some other hand than his attend its wants."

I hear you say it. Novelists have said it, and the engineer and his engine at one time rivaled the captain and his ship, as examples of the relation between a man and his machine.

The Unsentimental Pooling-System.

But not to-day. The engine that went to the round-house when its driver went to sleep is a thing of the past. The driver who could and would drive only his one pet engine has no more a place in the modern scheme of things.

The modern practise, known as "pooling," is far less romantic, but earns more dividends. That big iron horse that has just backed down to hook on to your string of steel, baggage-car, Pullman, parlor-car, diner and club-car, may have, probably did, come in from a long run three hours ago.

It was turned over to a hostler, who took it to the wash-pit. Its fires were cleaned, it was coaled and watered and oiled and supplied with sand, and perhaps was wiped down. Slight repairs and adjustments, if needed, were made.

Then, ready for a new run, it was turned over to a new crew, "called" for the run, and Engine No. 444 is off again. And it continues to run, with short rests merely for cleaning of fires and small repairs, replenishment of its supplies, and oiling, until its boiler needs washing out or some major repair is required.

A different crew every run, a different engine for every crew. First one in, first one out—that is "pooling" of engines, which takes away the intimate relation of man and machine and doubtless costs a little more in coal and oil, and perhaps a little in efficiency by striking off the affection of a man for the engine he lives with. But on the other hand, engines are expensive—they are investments which must earn dividends, and the longer and harder they work, the cheaper they are.

It is a short life and a merry one for the American locomotive of to-day. It is work, work, work all the time until worn out. Its nurses, the round-house men, its doctors, the repair workers, keep it going.

When it is sick unto death, it goes to the railroad grave-yard, the scrap-heap. An undertaker—an engine wrecker—finishes up the once pride-of-the-rails, or else it is sold to some smaller, slower road where speed and strength and economy and continuous service are not so much in demand.

For one engine, this continuous service seems a little thing. But for sixty-five thousand engines you must think in big figures. It is not hundreds nor thousands nor tens of thousands nor hundreds of thousands of dollars that the railroads spend on repairs of locomotives in a year—it is hundreds of millions.

Upkeep Costs $200,000,000 a Year.

One hundred and seventy-five millions of dollars in repairs, twenty-five millions in depreciation, two millions in renewals, merely to keep sixty-five thousand engines in running condition!

True, not all of these are passenger-engines, but while it is true that the freight business is more important to the railroad than its passenger business, it must never be forgotten that freight never travels until man has traveled first. To the railroad, the money is in the freight haul—but the passenger must go swiftly and safely and in comfort or—there would be no freight to need hauling!

Just what the railroads spend in providing new iron horses can only be estimated. Two great manufacturing companies—the American Locomotive Company, which is a consolidation of many smaller manufacturing plants, and the great Baldwin Locomotive Company—supply the bulk of the engines. But many railroads build their own engines in their own shops. The Pennsylvania Company can turn out engines in their Altoona shops at the rate of one a day, and do so constantly, and other great roads are not far behind.

Twenty-five hundred locomotives in 1914 were ordered and built for American, Canadian, and Mexican railroads, a small number compared to previous years, for the war on one hand and business conditions on the other cut down the need. Almost three times as many were built in 1906, and over twice as many in 1913.

Special Manufacturing Problems Involved.

Nor is the building of a locomotive a matter which must be compared either financially or technically to the manufacturing of any ordinary article of commerce. For a locomotive must not only do certain things and accomplish certain purposes—it must do these with safety and reliability.

Hence it has been that the progress of the steel industry has been the progress of the making of locomotives, and that you, who sit in a parlor-car and read a paper while being whisked at sixty miles an hour from place to place, are pinning your faith and giving your safety not only to the hands of the grimy man ahead and his knowledge and skill, but to the fidelity with which the steel-maker has accomplished his task, and the skill with which he has turned out that substance on the strength of which depends your life and the lives of all who ride on rails.

It was largely to increase that safety that the steel car came into being. Much has been written and said of American railroads and their lack of safety, of the rapidity with which we had accidents and the small value we put on our lives in risking them on poor tracks in wooden cars at high speeds. Undoubtedly much of it is true.

The Wooden Car Is Going.

Yet do we ever think of it when we take the train—do we decline to ride in the wooden death-trap, or, if we are on a "jerk-water" road, stay off the car because it has the deadly car-stove?

We do not. The railroads themselves have worked the reform of the steel car, and to-day the wooden car is doomed. In 1914 there were fourteen hundred steel cars and three hundred and fifty steel under-frame cars ordered in this country for American use, while only two hundred wooden cars were contracted for.

These figures, compared to 1911, when the steel and wood orders nearly balanced, show the trend of the times. In that year 900 steel cars were bought against a thousand wooden ones. Within a very few years the last of the wooden passenger-cars will have been scrapped and only the safer steel ones ordered or used.

The modern passenger-car which you enter so carelessly represents a growth commensurate with that of the locomotive. Circumscribed as to width as is the locomotive, it can grow only in weight and length. From forty feet—an early "standard" size—the modern car is now seventy, even eighty feet long.

The average modern steel car of great capacity weighs a trifle of 135,000 pounds, and may weigh as much as 170,000 pounds. If it seats eighty-eight passengers, of an average weight of 140 pounds, it provides eleven pounds of steel for every pound of passenger, in order to give safety and comfort.

And when it comes to Pullmans, much heavier, and with greatly lessened capacity, the proportion of dead weight to "live" weight rises to unprecedented proportions.

Steel Wheels Now.

All this tremendous weight has led to drastic changes in that part of the car you never see or think of, yet that part which is vital. Your car will be carried on six wheels at each end, each collection of six known as a six-wheel bogie truck. Those wheels will not be, as formerly, of iron, with a chilled edge, but of the best of steel.

This is a debt the passenger owes to the freight needs. For the iron wheel was good enough for freight-cars up to sixty thousand pounds capacity. When hundred thousand pound loads came into being, however, master mechanics reported more and more wheel failures. Superintendents became uneasy, alarmed, finally desperate.

Loads must decrease or wheels increase in strength. So the strength of the wheels increased, and the rolled-steel wheel—expensive, it is true, but strong—made its appearance, and went under the heavy steel passenger-cars as a matter of course.

Rails Present Greatest Problem.

And what of the rails on which these cars run? Not a story of the railroad but of the train itself. But little can be said of it here, save that it still represents the greatest problem now before the railroad world. We have rails weighing a hundred pounds to the yard, made of steel in which the carbon content is as high as the steel engineer dares to make it.

The rails are laid on as perfect a roadbed as money and brains can encompass. But the fact remains that a weight of twenty thousand pounds at one point on a steel rail will make a visible mark, and that, running at sixty miles an hour, the least unevenness in the rail will cause a blow of many times that weight.

Hence we have broken rails—broken rails which often cause terrible wrecks, and which the whole steel industry and the whole railroad world is trying to stop. It is not, as is sometimes alleged, a matter of economy—it is a matter of don't know how, as yet, to make a usable rail of steel which can be everlastingly relied upon not to break under the unknown stresses of a heavy train at high speed.

Of this, too, no passenger thinks as he enters his train, any more than he thinks of the one underlying foundation which, after the power of steam itself, makes all the railroad, from track to terminal, from signal to station, from ticket to train, a possibility.

For, curious though it may be, it is none the less a fact that the whole super-

structure of the modern railway rests on one thing. That one thing is the brake.

The early railroad builders had only two essential things to make—a track on which to run, a means to pull the cars on the track. The modern railroad would never have existed had a third essential not been discovered.

For the modern train, its size, its speed, its schedule, its safety, its very life, is made possible by a means of stopping the train when desired. Had there been no George Westinghouse, or some one to do his work, there would be no express trains.

What Do You Know of the Air-Brake?

Every one knows that the modern train is equipped with air-brakes. Many know that it is law that all trains must be so equipped. Practically no traveler, outside of technical men, has any real knowledge of how an air-brake works. Ask one, and see.

"Why, it's very simple," he will tell you. "There is an air-pump, and it compresses air. When the engineer wants to stop, he turns on the compressed air. It flows into cylinders and pushes on pistons which apply brakes to the wheels, and the train stops."

That answer would have been true of the first air-brake—the "straight" air-brake as it is now called. But it is not true to-day. It was true when George Westinghouse received, after much trouble and many applications, a kind permission to try his brake on a train.

No one believed in it—no one thought there was any real merit in a "wind-brake," as opposed to numerous brakemen turning numerous wheels which wound numerous chains about axles and thus applied brake-shoes to many wheels by man-power.

But it happened that a farmer in a cart got stuck upon the track the first time the new brake was taken out on a run. The engineer whistled "down brakes," as usual, even while he knew that he was too late. The hand-brakes went on and on tight, for there was urgency in the whistle.

Yet the heavy train still slid, shrieking, to the destruction from which the engineer covered his eyes.

Suddenly he bethought him of the "wind-brake." It would do no harm, at least. So he turned it on, and to his utter amazement the train stopped just short of an accident.

That was enough. The air-brake was a success. And it was adopted everywhere. But it soon proved less reliable than efficient. It stopped trains—when it worked. But a leak in the pipe that carried the air, a breaking in two of the train, put it out of business.

Besides, air moved slowly, and on a long train the brakes next the engine "set" long before those in the rear received their air. The result was an attempt on the part of the rear cars to climb up in the laps of those ahead.

From the disadvantages of the straight brake came, by gradual development, the really wonderful "triple-valve" brake of to-day. In itself a piece of apparatus as complicated as its principle is simple, real knowledge of the way the air-brake works has percolated to the general public not at all. Yet it is not hard to understand.

To-day every car in that luxurious train the passenger boards has beneath it tanks to hold compressed air. These tanks are connected, by means of flexible tubes between cars, with the tank and with the air-pump on the engine. When the engineer lets compressed air into the "train-pipe," as it is called, it flows into the car-tanks, passing through the triple valve.

Triple Valve Guides Air Aright.

When the pressure in tanks and in train-pipe is on—let us suppose a hundred pounds to the square inch—the brakes are ready to operate. When they are to be operated, the engineer turns a valve in the engine which lets air *out* of the train-pipe. The air in the various car-cylinders or reservoirs of course tries

to follow the line of least resistance and go back into the train-pipe.

But the triple valve intervenes. Air flowing back into this valve, closes it to the train-pipe, but opens it to the cylinders which operate the brakes. As soon as the pressure in reservoirs and train-pipe is equalized again, the triple valve cuts off the supply of air from the reservoirs.

If, now, the engineer raises pressure in the train-pipe again, the reservoirs are again charged, and the air in the brake-cylinders is allowed to escape.

Pressure Reduction Sets Brakes.

The immediate results of this manner of applying the air are two—both highly important. First, all the brakes on a train are applied within a very few seconds of each other, since the reduction of pressure along the train-pipe is very quick; second, a leak in the pipe, a breaking in half of the train, resulting in that reduction of pressure, *immediately* causes the triple valve to work and set the brakes.

Before, a train broken in two was helpless. To-day, an air-brake equipped train that breaks in two stops almost instantly.

But the genius which made the air-brake didn't stop with the triple valve. Quick as it is, reduction of pressure in the train-pipe does take seconds—two, three, maybe four.

At sixty miles an hour, four seconds mean 358 feet of progress. That distance may spell all the difference between a wreck and safety.

Hence the electro-pneumatic brake of to-day, in which each individual car's brakes are controlled by an electric impulse, which is instantaneous, while leaving the train-pipe and the triple valve and the usual air-brake control exactly as it was before.

It is difficult to realize what the air-brake has done for the railroads—difficult for you and for me to understand that only because we can stop quickly do we dare run quickly. But because the air-brake reduced headway between trains it increased the capacity of the equipment.

Because it makes speed possible, it opened the doors of size and strength to the locomotive designer. That meant increased power to haul, greater profits and —better equipment as a result.

Had it not been for the air-brake, not only would we jog along at a gentle twenty or thirty miles an hour, but we would ride in poor and cheaply fitted cars, on bumpy rails, and only from center to center—never, as now, practically to any hamlet in the United States to which our fancy or our business takes us.

Just where the air-brake is going to stop is as much a problem now as just where the trains to which it was first applied were going to stop when its possibilities were unknown. Its progress has been the progress of railroading, of speed, of efficiency. As late as 1890—and in that year the public believed that railroads were as near perfect as ingenuity could make them—a train of 280 tons was a heavy train. At sixty miles an hour it had an energy of 33,000 foot tons—that is, if it hit anything, it hit it like 33,000 tons moving through a foot of space. The air-brake of 1890, working at its best, could just stop the train in a thousand feet.

Can Stop 920-Ton Train in 860 Feet.

To-day a train of 920 tons is not abnormal. At the sixty-mile-an-hour speed it develops an energy of 111,000 foot tons. If it was equipped with the air-brake of 1890, it could not be stopped in less than 1,760 feet.

At the thousand-foot mark it would still have a collision energy of 48,000 foot tons, which is about one and a half times the amount of the 1890 train *before* the brake was applied. But the train of to-day, with the air-brake of to-day, under the conditions stated, can be stopped short in 860 feet!

It is this wonderful efficiency of the air-brake which makes the modern train

possible. It increases the revenue which a crew can earn in a day. It increases the dividends from the locomotive, which can haul longer trains, haul more of them, haul them faster.

It increases the capacity of the cars, which can so haul more passengers. It increases the earning-capacity of the highly expensive track, which can hold more trains in a day's work. It promotes greater traffic which becomes larger as service is quicker—and safer.

Train Undergoes Many Inspections.

You have bought your ticket and passed through the gate. Here on the track, where you expect to find it, is your train. It has from five to ten cars, selected from fifty-three thousand passenger-cars running on American rails.

The engine—one of fourteen thousand five hundred passenger-engines—has been overhauled, inspected, pronounced fit. Every car on the train has been tested as to the soundness of its wheels, its running order. Most of them have come but recently from the shop, where expert master mechanics have overhauled and gone minutely into every moving part, particularly every part of brake and bogie truck.

Inspectors have passed through the train to see that it was up to the standard of the railroad in every particular, from complete equipment to cleanliness of carpet.

Secure in faith in the power of engine and of brake, you enter your car. You may have watched the man in blue who looked at your ticket; it is doubtful if you gave more than a thought either to him or to the man in gray in the cab.

Safety, Safety, Safety!

Yet, were it not for the man in blue and the man in gray—yes, and countless other men in all sorts of colors—you could not move a foot. Men in short sleeves in many a tower, men in alpaca coats bending over many clicking instruments, men in greasy clothes who walk the track, men in nondescript clothing who direct in far-off offices, men in khaki out on the line building it up and in new directions for your pleasure, are all concerned with your safety, your comfort, your safety, your speed, your safety, your promptness in arriving, your safety, your satisfaction with your trip, your safety, the satisfaction of your desire for luxury, and finally your safety, safety, safety.

Something of the men who run the engines and man the cars, how they got to be what they are, what the requirements may be, and what the railroads do to get the right kind of men and what they do for them when they get them, is too long a story for this paper, but will be the subject for the succeeding chapter in this story of the passenger-train. This succeeding chapter will appear in next month's issue.

THE SIGNAL ENGINEER SAYS:

BREAKING a rule may be a good thing in an emergency, but remember it's a challenge and you've got to sustain it with brains, not recklessness.

FROM THE RAILROAD MAN'S MAGAZINE.

SPECIAL TRAIN MADE UP BY THE BALTIMORE AND OHIO TO DEMONSTRATE WHAT WASHINGTON IS DOING TO SAVE THE LIVES OF AMERICANS—IT CONTAINED INTERESTING EXHIBITS FROM THE INTERSTATE COMMERCE COMMISSION, THE AMERICAN RED CROSS, AND FROM FIVE DEPARTMENTS OF THE FEDERAL GOVERNMENT

UNCLE SAM FOR SAFETY FIRST.

Citizens See Quarter-Mile of Education through Cooperation of Baltimore and Ohio with Government.

BY OLIN L. LYMAN.

LAST spring benevolent Uncle Sam, with the first aid of President Daniel Willard of the Baltimore and Ohio Railroad Company, determined to treat uncle's people to a quarter-mile of popular education in the perfected efforts of the great organization to further personal safety.

The activities of the Federal government in this good cause have been shown at various expositions and world's fairs. Those attending these exhibitions had the opportunity to check up uncle's attention to safeguarding life and the pursuit of property, and found that he registered about 100 per cent.

But there have been many people who have had neither the time nor the mileage to journey to Buffalo, or Frisco, or St. Louis, or Chicago, whereupon uncle determined to whisk a traveling exhibition about the country at which he might point with pride.

So Hon. Franklin K. Lane, Secretary of the Interior, asked the cooperation of President Willard, who with cheerful and progressive spirit promptly placed an all-steel train of twelve cars at the disposal of the government.

The equipment included nine coaches and a baggage-car to contain the government exhibit; a sleeping-car and a dining-car for the nation's officers and employees. The interiors of the exhibit-cars were arranged by the Treasury Department, War Department, Navy, Interior, Agriculture, Interstate Commerce Commission, and American Red Cross Society.

Free exhibitions were arranged in various cities on a trip over the Baltimore and Ohio system, the itinerary covering daily "shows," except Sunday. Other systems then grabbed it.

Briefly, the train drives home the lesson that, according to reliable estimates, there are 75,000 persons killed by accidents each year in the United States, and more than 2,000,000 injured. According to Federal officials, these casualties can be cut in two by correct safety-first practise, and the government's safety-first train showed how.

The big significance of "Safety First" was impressed upon the minds of great throngs of sightseers. The government's first educational special train was everywhere voted a resounding success.

Visited Many States.

The special rolled out of the Union Station at Washington Monday, May 1, at 9 A.M., after official inspection by President Wilson and members of his Cabinet, various government officials, President Willard of the B. & O., and his executive staff and general officers. And thereafter the people were kept informed of where it was going, and it continued on its way, playing to the S. R. O. sign.

It bowled merrily westward, traversing the States served by the Baltimore and Ohio—New York, New Jersey, Delaware, Maryland, Pennsylvania, Virginia, West Virginia, Ohio, Kentucky, Indiana, Missouri, and Illinois — all these commonwealths were visited.

The swing around this system was completed June 30, and in these two months a third of a million people had swarmed through the cars to take tabs on your energetic old uncle. And what they said would never hurt his feelings.

Such was the success achieved that other railroad companies requested that the exhibit be sent over their lines. So Secretary Lane arranged with President Willard to requisition the train for sixty additional days. The Missouri, Kansas and Texas Railroad grabbed it for thirty days, and the Union Pacific desired it for thirty more.

The M., K. & T. took it July 1. It started clicking over the rails of Missouri, passing to Kansas and Oklahoma. Kansas decided that there was nothing the matter with it, and Oklahoma turned out more people to the square mile to visit it than sequestered Easterners dream dwell in the whole tract.

The average of visitors reported to the train after the first three weeks was 50,000 persons per week, which was as many as could be accommodated during the hours of exhibition, which were from 1 P.M. to 9 P.M. The advancing itinerary was announced ten days before the train reached a given place.

Following its run over the M., K. & T., the Union Pacific took it, extending the itinerary through a number of the States traversed by that system.

Said Secretary Lane on July 5:

"I feel that we have been very fortunate in obtaining such generous cooperation with the Baltimore and Ohio Railroad. If it had not been for the patriotic action of President Willard the train would have been an impossibility. For the Federal government did not have the quarter of a million dollars necessary to purchase such a train.

Lane Wants Government-Owned Train.

"I hope that the day will soon come when the government will feel that it can afford to own and operate such a train to the end that people may have an opportunity to learn more about what their government is doing along these humanitarian lines."

The idea underlying this traveling exhibit was to bring intimately to the public the knowledge of what the government is doing directly for the homes.

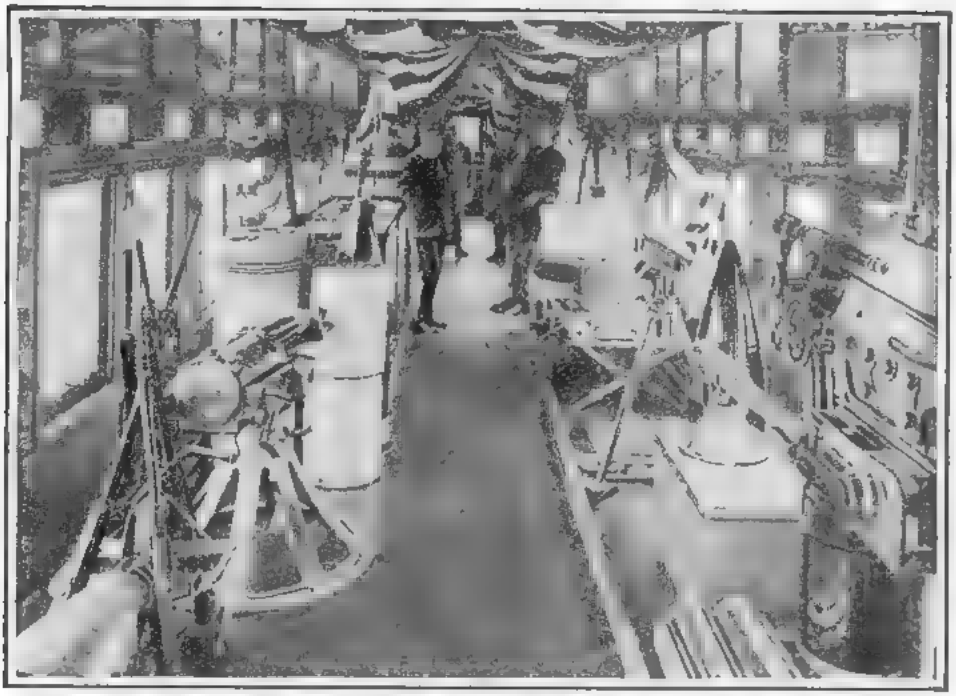
For instance, the Public Health Service, Department of the Treasury, showed by models and charts how uncle is applying the strangle hold to disease.

This branch has the assignment of keeping epidemics outside our borders. It claims that present widespread immunity from typhus fever, cholera, and yellow fever is due to the efficiency of the quarantine service.

As the experts have toiled in the past

THE COAST-GUARD SERVICE DISPLAYED AN ENTIRE LIFE-SAVING EQUIPMENT—RED CROSS EXHIBIT INCLUDED FIRST-AID KIT.

THE INTERSTATE COMMERCE COMMISSION'S CAR WAS ALWAYS THRONGED. THE I. C. C.'S DIVISION OF SAFETY SHOWED HEAVY REDUCTIONS IN DEATH-TOLL THROUGH THE ENFORCEMENT OF PROPER LEGISLATION



THE NAVY DEPARTMENT SENT MEN TO EXPLAIN THE WORKING OF BIG GUNS, ILLUSTRATED BY MODELS—A SMALL WIRELESS OUTFIT, BORROWED FROM A SUBMARINE, WAS ALSO OPERATED.

THE WAR DEPARTMENT'S EXHIBIT OUTLINED THE WORK DONE BY ALL ITS IMPORTANT BRANCHES. EMPHASIS WAS PLACED ON THE ARMY MEDICAL DEPARTMENT'S SUCCESSFUL EFFORTS TO CONSERVE LIFE AND HEALTH

to minimize these disorders, so they have been working this last summer, in conjunction with local authorities, to conquer the latest scourge of infantile paralysis.

Exhibits in the car devoted to this department showed that the death-rate from preventable diseases is being continually lowered in the cities.

The urban dweller is generally protected in the water he drinks, the food he eats, and the manner in which his working conditions are regulated.

The country places are far more archaic, with the result that the death toll in these has usually not been lowered.

Altruistic Progress of Railroads.

One of the most popular exhibits on the train was that of the Interstate Commerce Commission. This included all the safety appliances approved by the government for transportation service.

The exhibit comprised hand-brakes, car-couplers, uncoupling-levers, sill-steps, ladders, hand-holds, running-boards, signals, and block-signals.

From the fact that a twelfth of the male toilers of the land are engaged directly or indirectly in service for the railroads, this exhibit attracted remarkable attention.

Whether or not one is employed on a railroad, everybody rides on one, and this particular car was always thronged.

The exhibit illustrating the work of the Locomotive Inspection Service was a magnet. In this work the government supervises from a "safety-first" standpoint the condition of some 68,000 locomotives in the country.

The exhibition car held a complete working model of a locomotive used to illustrate defects which the law aims to remedy. Two complete boilers were shown which could be fired and were used to show the circulation of water. There were various samples of failed material which have caused accidents.

This work of inspection is made possible by the cordial cooperation of the carriers. The government division of Locomotive Inspection comprises a chief and two assistants, located in Washington, and fifty field inspectors.

There are monthly inspections and rigid annual tests. The carriers are required to make these and to file sworn reports with the Federal inspector in charge of the district where the locomotive is operating.

The government inspectors, however, are by no means allowed to sleep on their jobs. During the past fiscal year 74,000 locomotives were personally inspected by the government. Of these 6,968 were held out of service for repairs or strengthened to conform to requirements.

In its efforts for public safety the government has had the moral and practical support of the big systems themselves, just as happened in the case of the traveling exhibit for which President Willard loaned the necessary train.

Through this cooperation of government and railroads in protecting life and limb there has been a big improvement in the death and casualty list.

The so-called Safety Appliance Law was passed in 1893. The law did away with the practise of men going between the cars to couple them.

Big Decrease in Accidents.

In 1893 44 per cent of all accidents suffered by trainmen were due to coupling and uncoupling cars. In 1915 less than 6 per cent of these accidents were due to this cause.

In 1915 the accident records show a decrease of 81 in the number killed and 700 in the number injured from this cause as compared with the previous year. During the same year there was a decrease of 185 in the number killed and 4,300 in the number injured from falling from or getting off cars and by coming in contact with side and overhead obstructions.

In 1913 Congress authorized the commission to report upon devices to increase safety in railroad operation. Since this 475 such devices have been examined.

THE WEATHER BUREAU POINTED OUT THAT ITS TIMELY WARNINGS HAVE SAVED GREAT LOSS OF LIFE AND PROPERTY BY GIVING INHABITANTS OF A TERRITORY ABOUT TO BE VISITED BY STORM AN OPPORTUNITY TO PREPARE AGAINST ITS COMING.

THE BUREAU OF MINES LOOKS AFTER THE SAFETY OF MORE THAN A MILLION WORKERS, AND IS ENGAGED IN MAKING FIRST-AID EXPERTS OF THEM ALL. IT HAS TRAINED OVER 30,000 MINERS TO TAKE THEIR PLACES IN ANY HOSPITAL CORPS.

The block-signal system is universally recognized as the safest method of railway operation now in general use.

On January 1 of this year there were 30,942 miles of road equipped with automatic block-signals and 65,633 miles equipped with non-automatic block-signals, or a total of 96,575 miles so served.

During the first year after the passage of the law creating the Division of Locomotive Inspection, there were 856 accidents traceable to the failure of locomotive boilers or their appurtenances. Ninety-one deaths resulted, as well as 1,005 cases of personal injury.

From this high-water mark the number of accidents, with their accompanying casualties, has steadily receded. In the last fiscal year there were only 424 boiler accidents, resulting in but 13 deaths and 467 injuries.

Within three years the efforts of the Division of Locomotive Inspection have been attended with a reduction of 50 per cent in the number of accidents, 85 per cent in the number of deaths resulting, and 53 per cent in the number of personal injuries.

In the face of this record Congress on March 4 of last year increased the jurisdiction of the inspection service to cover the entire locomotive and tender.

The exhibit in the car embraced a wide range. Sections of rails causing accidents because of transverse fissure, split head, seamy base, fractured web or piping were shown.

There were sections of failed bridge material, of treads of chilled car-wheels and specimens used to show the internal strains in steel rails.

Model Couplers and Cars on View.

Charts were exhibited illustrating the safety and economy of the compulsory use of coupler and air-brakes. A number of model automatic couplers were seen, and eighth-size model box-cars and flat-cars with the full approved equipment for the safety of employees.

The contents of the twelve cars were sufficiently varied to give the spectator the impression that he was witnessing a whole exposition in miniature.

The Coast Guard Service of the Department of the Treasury showed a whole life-saving equipment, including a surf-boat. The War and Navy Departments each had cars devoted to display of apparatus and models of instruments.

The Navy Department had models of the great guns that are on the battle-ships, and there were men from the service to explain their working. Models of pre-dreadnoughts and raiders were shown.

There was a portable wireless outfit and a specimen of the death-dealing torpedo, which costs variously from $4,000 to $8,000—an expensive proposition unless the aim is good.

The War Department's exhibit covered all or nearly all branches of the service. Army officers and men were on hand to make clear the operation of the paraphernalia on view.

Mines Bureau's Wonderful Apparatus.

Turning to the Department of the Interior, the Bureau of Mines showed the apparatus for the saving of life. This exhibit was one of the most comprehensive and important of the whole series, and attracted especial attention everywhere. The bureau sees to the safety of more than a million miners throughout the United States, and is engaged in training every one of this huge number to proficiency in first aid. In addition, it has a corps of 30,000 miners thoroughly prepared, through the bureau's efforts, to be taken into the membership of any hospital corps.

The apparatus used in training the miners to first aid and in saving the unfortunate victims of mine accidents was also exhibited. The list included wonderful inventions permitting wearers to enter places filled with poisonous gases; others providing telephonic communications with the outside world for pent-up miners, life-saving birds, oxygen pumps and cylinders for the asphyxiated, and safety lamps.

The Reclamation Service, the home-making bureau of the government, showed its methods of reclaiming desert wastes for the occupation of humanity.

The Great American Desert contains 40,000,000 acres, which if reclaimed would make homes for 20,000,000 persons and add four billion dollars to taxable property and one billion dollars in annual crops returns.

The Department of Agriculture showed how it prevents, detects, and suppresses forest fires, saving scores of human lives and avoiding the destruction of millions of dollars' worth in property.

The Weather Bureau demonstrated how it has saved, by timely warning, great property values threatened by the approach of storms and floods.

The American Red Cross Society, First Aid Division, operated under the direction of officers of the Medical Corps of the United States Army, had an exhibit. This division has a staff of physicians and a life-saving expert.

These men are available for detail as instructors in mines, camps, railroads, telephone, electrical concerns, and factories; also for police and fire departments of cities, Y. M. C. A., *et cetera*.

THE OLD MOGUL.

BY OLIN L. LYMAN.

IT looks like a hybrid of kettle and can
As it snorts in the shifting-yard;
It's an ancient relic of "also ran,"
And its lungs are wheezing hard:
And the Baldwin coursing the long main track
Hoots at the mogul which can't come back.

Time was when the little, old tramp was new,
And the Baldwin of its brief day,
But the span of the iron steed's progress flew,
And its tenure has passed for ay;
On the right-of-way, with its spinning wheel,
The path of Vogue is a shifting reel.

At the end of the day, when its task is done,
While it rests in the roundhouse there,
Perhaps it remembers a bygone run
When it split the startled air,
And the billows of smoke that was thick and black
Were flung with the miles from its portly stack.

One day a conglomerate kettle and can
Will toil in the shifting-yard,
Stuffy and puffy and under the ban,
Till the scrap-heap ends the card,
And an engine coursing the long main track
Will hoot at the Baldwin which can't come back.

With *the* Inventors

BY LESTER L. SARGENT.

WE print with each invention described the number of its patent papers. Readers wishing to secure more minute details and drawings of these patents can order from the United States Patent Office, Washington, D. C., by giving the number. The government charges five cents each for patent papers. Remember that stamps or other forms of currency are NOT *taken. A five-cent coin must accompany each single order.—THE EDITOR.*

AUTOMATIC TICKET-SELLER.

MUCH of the work of the country station-agent can now be performed by a Railroad Ticket-Machine, No. 1,188,519, invented by the late Frank J. Wills and recently patented to the National Cash Register Company of Dayton. It issues tickets good only between the station at which the machine is located and other stations along the route.

Besides doing the work of the honest ticket agent it is arranged to keep tab on tickets sold, by automatically controlling the recording of the issue of the ticket. This, it is explained, is "so as to prevent an adroit manipulation on the part of the ticket seller."

The machine, which is an intricate one, prints a record of each ticket sold, thereby mechanically auditing the work of the station-agent.

The apparatus includes controlled devices for setting the mechanism in the proper position for printing the particular ticket desired; a printing device for printing the ticket; a ticket consecutive number printer, such as the "Veeder" counter; adjustable electros for the printing device adapted to print on the issued ticket the necessary data indicating whether it is "full fare," "half fare" or "excursion" rate, a set of rotatable number printing wheels and mechanism for operating them; an auxiliary printing device, for printing additional information on the issued tickets, such as the familiar disclaimers of responsibility on the part of the railroad company for situations in which the traveler or his baggage go wrong, a device for severing the ticket from the machine when it has been duly printed; an audit printing mechanism; an ink roller, and mechanism for adding and recording the total amount of money which is taken in for tickets issued and sold.

All these devices are arranged to co-operate within a single machine, which leaves to the station-agent merely the simple duties of a cashier. To issue a "full fare" ticket to, say, "Hicksville" the agent will grasp a knob on a lever on the left hand end of the machine and move the knob in an anti-clockwise direction until it reaches the portion of the machine bearing the name of the station "Hicksville."

Another crank handle is then given a turn. This causes the printing of the number and other information on the ticket and also on the record strip that audits the tickets issued. Upon the completion of the printing operation the issued section of the ticket strip is severed and the record strip is advanced a single printing space.

The printing device during this operation has made one complete rotation and is in position to print another ticket. The operation of an auditing lever throws other mechanism into *inoperative* position when it is desired to determine how many tickets have been issued to each of the stations for which the machine is equipped

The record strip may be fed out through a slot in the rear part of the machine by turning a small knob, when it is desired to detach its printed portion for the benefit of the railroad auditing department.

FREIGHT ROUTED BY MACHINE.

FREIGHT is delivered at its proper destination instead of landing at some station hundreds of miles away, or wandering off on other lines, when the newly invented Freight-Routing Apparatus, No. 1,188,060, invented by Richard F. Fitzhenry and John G. Ebner, of Chicago, is employed. A series of cards and a box in which they fit snugly is provided.

This box has a series of obstructions disposed perpendicularly relative to the tickets. Each card has lines or graduations extending across it, each of the spaces between which are numbered from 1 to 9 in three consecutive sets of numerals.

Suppose the box for the particular freight car is number 137, this number designates the location of the car in the freight yard, and also its destination. The edges of the cards are punched out by the routing clerk at the numbers "1,"

"3," and "7" as the goods described on the particular card are carried into the car "137."

The goods must be correctly loaded and the cards punched with the correct car number in which they are loaded or they will fail to fit into the box and the loader will be warned of an error. The freight loader inserting a card into the box must first raise a cross bar which on release contracts with a device that is moved out of proper position when a card fails to fit into the box in consequence of improper loading.

An electric bell on the device is sounded by the operation of this cross-bar when it fails to resume its customary position after being raised and a new card inserted. With this system it is claimed that it is practically impossible to load freight shipments in a wrong car, as the check upon the placing of the freight is so thorough as to practically eliminate error.

NEW VIBROPLEX COMBINATION.

A NEW Telegraphic Sending-Machine, No 1,189,546, has been invented by Paul Dinger, of Cleveland. It combines the automatic dot-sending mechanism of the vibroplex type of sender with the common vertically moved key lever and finger piece.

With this combination the telegrapher who has not before operated an automatic vibrating machine should find it comparatively easy to learn to operate it, since the up-and-down movement of the key lever is already habitual

The usual vibratory reed is employed. An opposing spring arranged to intermittently contact with it, there being a circuit-closing lever for the spring. A vertically pivoted detent member normally engages the weighted reed.

The finger key-lever is connected for alternative actuation of the detent or circuit-closing mechanism, to send dots and dashes as required. The mechanism is less intricate than that of most sending machines of this type.

NEW SAFETY APPLIANCE.

JOHN M. POWERS, Valley Falls, New York, has devised a Safety Appliance for railway cars, No. 1,188,558, which will make cars practically non-derailable. The device has a venting valve connected to the air brake system of the car.

Suspended from the girder are blocks secured to the car by bolts of sufficient strength to sustain the weight of the lower one of the two blocks, but which as soon as the weight of the axle is added will break. Attached to the lower block are hook-shaped rods embracing the axle of the car.

A cross-bar is carried by the depending arms. Arranged to cooperate with the bevel ends of the cross-bar are flanges or disks attached to the axle. This cross-bar overcomes any tendency of the car-wheel to rise to allow the flange of the wheel to ride the rail, by reason of its position over the flanges or disks attached to the car-axle.

Or if the axle should break, its weight will operate the valve that applies the air-brakes.

The inventor, who is a freight and passenger agent on a New England railroad, points out that an examination of the box-cars and passenger-cars in general use will serve to show any one that there is absolutely no protection against wrecks from broken wheels or broken flanges; and that broken flanges will cause almost as many wrecks as broken wheels.

Especially in the winter time wrecks from these causes are frequently reported. The new safety appliance operates in such a way that when the wheels break on one end of the axle, the wheel on the other end will be kept safely on the rail. At the same time the weight of the axle will cause the mechanism to automatically apply the air brakes to the train, bringing it to a safe stop without derailment.

The appliance also operates to prevent flanges riding the rails, which they sometimes do from no apparent cause, and which is the occasion of many bad wrecks.

"The wreck on Shelburne Hill," writes the inventor, "called my attention to the importance of a system to prevent wrecks from such a source. About two years ago the Boston and Maine railroad had a very bad freight wreck near Shelburne Falls, Massachusetts. The road is double tracked.

"A westbound freight was pulling up the hill and an eastbound freight was going down the hill, when a wheel broke on a loaded car of the eastbound freight, causing the train to plunge directly into the third or fourth head car on the westbound train, causing a very bad wreck which tied up the main line at that point for about thirty-six hours. Twenty-seven loaded cars of freight were destroyed."

The cost of installing safety appliances, large as it may be, is hardly as expensive as wrecks of this nature. The property loss of this particular wreck was estimated at over one million dollars.

ADJUSTABLE CROSS-HEAD GUIDE.

A READILY adjustable locomotive Cross-Head Guide, No. 1,189,318, has been invented by Hugh H. Walck, Chambersburg, Pennsylvania. A locomotive cross-head has two guides, an upper and a lower one, but adjustment for wear is preferably made only at the lower guide

This is because any adjustment of the upper guide may derange the cylinder valve mechan-

ism. It is also very important that there be not too much looseness. A horizontal bar bolted to the cylinder head and a yoke at its opposite ends is employed as the base or fixed member

On this member is an adjustable bearing block to receive the wear. Adjustment is effected by means of bolts the heads of which project into T-slots in the underside of the wear-receiving upper block.

The protruding end of the bolt is provided with a triangular head in order to compel the use of the socket wrench which will be kept at the round house, so as to avoid the danger of any one but the properly authorized workmen from changing the adjustment.

Supporting plates are positioned at each end of the lower block in recesses for that purpose.

HANDY REFLECTOR FOR ENGINEERS.

IN place of an inconvenient arrangement of lights hung from the roof of the engine cab, James L. Boyd and Leo Sawalhrch, Glendive, Montana, have jointly invented a Light Reflector, No. 1,184,613, that is not in the way of the engineer. The reflector has adjustable diverging side wings and upper and lower webs above and below the light, extending across from one wing to the other.

The device is attached to the wall where it will be out of the way and yet reflect the light on the gages and water glass where it is wanted It is so constructed as to prevent the light from shining upon the front windows of the cab.

DISTRESS CALL TRANSMITTER.

TELEGRAPHERS will be interested to learn of a new Wireless Transmitter, No. 1,190,973, that dispenses with the necessity for the services of a trained operator. The device is the invention of Chester M. Agner, Sacramento, California.

It is intended to provide a convenient method for enabling the sending out of the recognized distress call from vessels that do not carry regularly a wireless outfit and operator. The device can be operated without previous knowledge of wireless telegraphy. An equipment consisting of a suitable aerial and a sending set is provided

A disk or wheel is provided, having on its rim a series of blocks or like devices of metal with insulated portions. These blocks are contact members which can be arranged to telegraph complete words, numbers or the like, or recognized abbreviations, as the rotatable carrier to which they are attached is rotated.

For example, if the ship is in distress a block that will telegraph the call "S. O. S." is selected and attached to the rotatable disk or carrier, followed by blocks chosen to show the latitude and longitude of the vessel, which in turn may be followed by the word "Sinking" or "Burning" as the case may be.

The captain has but to start the motor, whereupon the wheel will begin and continue to turn at a suitable speed causing makes and breaks in the electric circuit corresponding to the telegraph code and wireless signals will be transmitted so long as may be needful, and all automatically without further attention from any attendant, The apparatus is not an expensive equipment.

STOPPING LEAKS.

AN improved Means for Arresting Leaks in Steam Superheaters, No. 1,189,643, has been patented by Lewis S. Watres, Scranton, Pennsylvania. A device is attached to the head or manifold into which finely divided graphite is introduced, at any point where it will be taken up by the saturated steam.

The graphite remains unchanged by the high temperatures. It deposits in all small crevices incident to an incipient leak and constitutes an efficient and durable plug, or packing.

BOX-CAR LOADER.

JOSEPH M. CHRISTY, Des Moines, Iowa, is the inventor of a new Box-Car Loader, No. 1,186,882, having a movable truck and a track and guide device so arranged that the end of the truck containing the loader may be inserted through the side door of the box-car diagonally. The truck containing the loader may then be moved through a segment of a circle.

In this way the loader frame is moved from a point near one end of the car to a point near the other end, enabling continuous loading and the directing of the material to any desired part of the interior of the box car without throwing the material to any considerable distance beyond the end of the loader conveyor.

TAKING TRAIN-ORDERS ON THE FLY.

WILLIAM H. WELCH, Alba, Michigan, has invented a new Train-Order Delivery Device, No. 1,179,483, by which a train-order or message can be taken by the engineer or conductor on a train without danger while the train is in motion. It consists of a large loop, in the spaced ends of which are loosely mounted the ends of a smaller loop that at its central portion has a coil which carries the message gripped by the spirals of the coil.

The large loop is held in the path of the passing train so that the engineer may readily

pass his arm through it and out through the opening, thus detaching the smaller loop, the ends of which spring together about the engineer's arm—so he cannot fail to get the message.

CONCEALED BUMPER.

JOSEPH B. STRAUSS, Chicago, has invented a new Car-Stopping Device, No. 1,189,750, or bumper, that is lowered between the rails except when it must be raised. It is used on paved streets for the protection of draw bridge approaches.

One end of the device is hinged to a cross-bar extending between the rails. The other end is free to be elevated. The device is intended particularly for use on street car lines.

TO AN INQUIRER.

E. J. G. Chicago.—Replying to your question, it is our opinion that a device that would automatically slow down a train by an application of the brakes if the train exceeded a certain speed limit at a specified point would be of value to railroads

Such a device would be useful near railroad bridges and in other places where it might be important that trains should not much exceed a certain low speed. It would eliminate sole dependence on the engineer at such points.

BRANNIGAN'S CAR.

BY OWEN HUGH O'NEIL.

BRANNIGAN'S car is the finest car
That ever ye went to church in;
It ain't like some o' these nabobs' cars,
Bouncin' around an' lurchin'.
Brannigan's car is the smoothest car—
Smooth as a baby-carriage;
An' Brannigan w'u'd not trade his car
For the best in John D.'s garridge.

BRANNIGAN'S car is the safest car—
It's never busted a tire;
Never demands a new spark-plug;
Never got stuck in the mire.
It runs the same when the snow lies deep
As it does when the grass grows green;
An', faith, he can run it a thousand miles
On a gallon o' gasoline.

BRANNIGAN'S car is the greatest car—
It's never been known to balk yet;
An' it never skids, an' Brannigan
Never had to get out an' walk yet.
An' what is the make of Brannigan's car,
This perky pink of perfection?
Sure, don't ye know? It's the old hand-car
In use on Brannigan's section!

THE END OF ENGINE 10.

BY JOHN H. BURNS.

The Strange Story of a Heart-Broken Locomotive Who Had Her Own Views on Life and Death.

IT was a warm, lazy afternoon. A dozen engines stood in the roundhouse, their pilots pointing toward the turntable in the center. The air was moist from sizzling steam which escaped from half-closed pet-cocks. Another engine, travel-stained, backed slowly in upon the turntable, thence into its stall: the reverse lever snapped spitefully into the center notch; the throttle was jammed vigorously home and secured there. Lightly the stalwart engineer dropped from the cab and approached the group idling at the roundhouse door.

"There's an engine for you, boys," he said. "You should have seen her climb Four Mile Hill; she did it without the loss of a pound of steam or a tick of the watch, and an extra Pullman on, too."

"Yes, she's all right," replied Dana, the one-armed roundhouse foreman, "but the original No. 10 would have pulled the drawbar out of your engine, up-hill or down, loaded or empty."

"Maybe so, Ed, but my engine is not such a durned fool as to try to fly across a cañon, as your old pet did."

Dana's empty sleeve was suggestive of wrecks and tragedies, and this, coupled with the taunt of the young engineer, aroused our curiosity. We begged for the story until he yielded.

"Well," he began, "I don't know why it is that one engine will prove to be strong, while another, a duplicate so far as human skill and modern machinery can make it, proves to be weak; why the one proves to be a runner, while the other proves to be slow. It is a problem engine-builders have tried to solve in vain.

"There came on the line with the old No. 10 a half dozen others, all class F Baldwins, all made by the same men in the same shops, and from the same patterns. Probably the closest measurements would not have disclosed a shade of difference between them, and yet, when it came to their actual performances, none of them even approached the Ten Spot.

"She was put into service with Jim Siever at the footboard. Jim was a cool, methodical, level-headed fellow and a great engineer. He had the happy faculty of getting the best out of an engine without fuss or worry. Jim loved that engine, and I think the engine loved Jim also. You know how Jim came to be given the Limited? No?

"It was this way: Baltsy, who was pulling the flier with No. 127, blew out a cylinder head down on Monee Hill. He lay there helpless. Jim was at Peotone with No. 10 and forty loads of No. 1 hard. He was given an order to bring in the passenger.

"Jim often said that the Ten Spot was a thoroughbred doing the work of a bronco. Now he had his chance to make good. He dropped down the hill, picked up the flagman, shoved Baltsy with the crippled 127 on to a siding, and brought in the train for forty-two miles in forty-two minutes.

"Jim pulled the train the next day, and then the next, and was finally given the

run. It was a pretty run, too, one hundred and ten miles in one hundred and twenty minutes. Every day thereafter until the end came, I sidetracked for Jim to pass. It always made my heart swell to see him, used as I was to railroading.

"It is very odd, but that engine, when at work, looked different from any engine I have ever seen; I can't tell you the difference; I can't describe it, but there it was just the same; she was clean, lithe, and graceful, like a well-bred hound or a Kentucky racer. The people along the line watched her as they did no other engine; the men would lift their hats to Jim, and the women waved their handkerchiefs at him, but Jim's clear blue eyes always clung to the rails.

"There was but one picture on the line sweet enough to make Jim forget the traditions. Just this side of Kankakee the road swept close to old Farmer Norton's door. When his pretty daughter, morning after morning, stood there, knee deep in the grass, and waved her bonnet, then Jim, master of that mighty machine, while splitting the air at the rate of a mile a minute, with the lives of hundreds of passengers in his keeping, let his eyes wander from the double thread of steel leading swiftly around the long Horseshoe curve. He flirted with the girl.

"At first he merely touched his greasy cap for the fraction of a second while he was passing; then he tossed off a morning paper; then it was a box of candy or some such trifle wrapped in the paper which fell among the daisies and the dandelions in the grass at her feet.

"Each day the same bonnet waved him a smiling good morning and good-by. It was an odd way to court a girl, but it proved all-sufficient. Finally Jim spoke to her; he didn't say much, of course, just a couple of gentle blasts of No. 10's whistle. She understood. It was her lover's greeting.

"Yes, all this was against the rules, but nobody said nay to Jim, for everybody loved him, from the superintendent down to the train-boy, and they merely smiled upon the little woman who had won the heart of their favorite.

"But I'll make the story short. One bright day in September they were married. They were a handsome couple. She was a little thing—didn't come much above Jim's shoulder—but the freshest, sweetest, bonniest little bride a man ever saw. And the way she looked at Jim out of those big, brown eyes! Why, with her the superintendent wasn't in it with Jim.

"Jim lived that winter down on the corner of Fourteenth Street, and never once did Ten Spot roll past that he didn't give his little love call, and never a trip, day or night, that she wasn't there to greet him.

"Summer came, and with it came Little Jim, a soft, white-haired edition of our Big Jim. Then it was the babe, too, wee mite of a thing as it was, for whom she threw kisses to Jim up there on the big engine.

"Along in the summer Jim was killed. His train had been delayed at the Belt Line crossing and flagged down for a doubtful culvert, and so he had lost time. When he reached the open country he was sending her along with a wide-open throttle.

"It was then that the Ten Spot made her first bad break; her right side-rod broke, and the thrashing end beat off Jim's side of the cab and flailed the life out of the gentlest man and the best engineer I have ever known.

"Jim's wife and babe went back to the farm. The engine went into the shops, and was given a new side-rod and cab and a general overhauling. When she came out she was given to me; that meant also the fastest and best run on the road, for the engine had a record as a runner to be proud of.

"When I backed her down for my first train, I felt that I had under me the best engine the company owned.

"I had a perfect rail and the ordinary load, such as she used to handle without an effort. Before I had cleared the yard limit, however, I felt that something was

wrong. She ate coal and drank water like a mogul, but run she wouldn't. I tried all the arts which almost a quarter of a century at the foot-board had taught me.

"She sulked like the very deuce. Do the best I could, I was forty minutes late.

"Returning the next day, she fairly ran away, like her old-time self.

"Now, mind you, she was not altered in a single hair, save the new side-rod and cab; but from the day I ran her out she was a bundle of eccentricities. One trip she wouldn't pull her train, but would steam as though to blow her dome off, and the next trip she would pull her train, but wouldn't steam.

"One morning, after I had been running her about a month, I was given the train late, with orders to run 'regardless.' I nosed my way along very carefully until I struck the open country, where I intended to do some running. I opened her out. She had the sulks again worse than ever before.

"Finally, however, I got her down to Farmer Norton's place, pounding all the way and losing time. There in the old place in the knee-deep grass stood Jim's widow, with little Jim on her breast.

"Why I did it then I don't know; I never did it before. But without thinking, I reached up and pulled the whistle-lever and gave Jim's salute. I knew I should not have done it, and was sorry even before my hand was off the lever, but it was done and I couldn't recall it.

"I shall not forget the look of startled reproach and agony which the little woman gave me out of those great eyes of hers; that look went straight to my heart.

"It was a few seconds before I gathered myself together. When I did, I found that something had happened to the old engine. Her exhausts came like great, muffled, human sobs; a strange shiver shook her frame of steel, and running, why, she was hitting only the high places. I eased up on the throttle, but it did no good.

"Gentlemen, the Ten Spot was running away, and drawing a full load, without using a pound of steam. I had jammed her throttle home tight.

"Like a flash there passed through my mind the number of cars in my train, nine of them. I could see the passengers laughing, talking, dreaming, and planning for the future, all confident that the old engineer up there ahead would take care that no harm came to their precious selves.

"In a frenzy I threw over the reverse lever and jerked the throttle wide open again and again. I threw water into her until she was full up to the dome.

"The speed was now something frightful, the train swaying dangerously. I called for brakes. You know, in those days we did not have the air brakes.

"The bell above my head jangled out 'Stop!' Evidently the train-crew were frightened, and there I was as powerless to control that engine as a child!

"I shrieked out another despairing call for brakes. I glanced across at my fireman. He sat there on his seat, rigid, his face already as white as death.

"I glanced at the track ahead. There lay that ugly twenty-degree reverse curve, with the trestle just at its apex, where I should have held her down.

"That's the story. The next thing I knew I was in the hospital down here on the corner; my good right arm was gone. The black bones of the old engine lay down in the gorge.

"She had jumped the track down into that pit of destruction without losing a spike, bolt, fish-plate, or rail; the train rolled on in safety until stopped by the brakes.

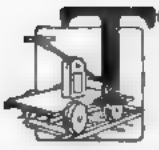
"I sometimes think that possibly we don't know as much as we think we do; that engines are possessed of loves and hates, of sympathies and antipathies; in short, they have souls as well as we.

"Is it not possible that the heart of the old engine was broken at the killing of Jim, and when I, fool-like, made her give his love-call to his sweetheart, wife, and babe, and she saw the look on the little woman's face, that she, like a heartbroken man, destroyed herself?"

R. R. IS AN INSURANCE POLICY.

Panama Line Keeps Freight Moving from Ocean to Ocean When Anything Happens to the Canal.

BY WALDON FAWCETT.



TO rank as an insurance policy, and a governmental insurance policy at that, is a distinction enjoyed permanently by only one steam transportation system. To the practical railroad man it might seem that the Panama Railroad has indeed fallen from high estate, considering that two or three years ago the line was handling more freight per mile of track than any other railroad in the world; but in its new rôle of emergency substitute for the canal the rail line across the isthmus is proving that it is worth all it cost quite aside from any consideration of service in connection with the building of the interoceanic waterway.

Handy When Slides Choke Canal.

It has required the "slides" that now and then block traffic on the canal—and are likely to continue to do so at intervals for years to come—to disclose the new function of the shortest of transcontinental railroads. When, at the inception of the canal project, the United States government acquired the Panama Railroad, as well as the right-of-way for the big ditch, few men in railroad circles or outside foresaw that the steel-tracked highway would be much of an asset after water had been let into the canal.

It was realized, of course, that the railroad had a most important responsibility in connection with the construction of the canal, but it was expected that when the big electric locomotives began to tow ships into the canal locks it would be time to junk the steam locomotives on the railroad.

Slides, though, have upset all such calculations. The avalanches of earth and rock that have already made necessary the excavation in Culebra Cut of thirty million cubic yards more than was originally contemplated have been numerous enough and serious enough to demonstrate that an alternative route for freight and passengers is desirable if not absolutely necessary.

Thus the slides have been responsible in a measure for the perpetuation and rejuvenation of this historic railroad; but incidentally it has dawned on the officials that the railroad is distinctly worth while as an all-around insurance policy. With this insurance policy in force they are enabled to contemplate with fewer misgivings the possibility of a tying up of canal traffic from causes other than slides, as, for instance, a derangement of lock machinery. Nor does this take into account the part played by the railroad in the defense of the canal.

Useful as a Stop-Gap.

In a serious tie-up of freight, owing to an accident on the canal, the Panama Railroad could not, it is realized, meet all the demands upon it. How could it, indeed, seeing that its maximum traffic record is under 650,000 tons a year, whereas at one time during the most

recent slide-blockade there were 375,000 tons awaiting transit through the canal?

However, the officials feel that because the rail line cannot carry the load in such peaks of traffic is no argument that the road is not worth while as a stop-gap.

Realization that the Panama Railroad must not only serve as the main artery of commerce and travel for a community of fifty thousand people, but must ever stand as a buffer for Uncle Sam against complete suspension of interoceanic traffic, impelled the Federal engineers to give special attention a few years ago to the problem of relocating the Panama Railroad.

For, be it known, the present rail line at the isthmus is a new railroad in the sense that it deviates from the right-of-way formerly occupied. The exigencies of the opening of the canal made necessary moving the tracks, but incidentally this was counseled by the economic considerations that weigh so heavily in modern railroad practise.

The new or relocated Panama Railroad is somewhat over forty-seven miles in length, or exactly 739 feet longer than the road it supplanted. For two short stretches, aggregating seven miles, the old line was used; but the remainder, totaling forty miles, is all new. From Mindi to Gatun the railroad runs in general parallel to the canal, ascending from sea-level to an elevation of ninety-five feet; but at Gatun the rail line leaves the canal and follows eastward along a ridge until a point is reached fully four and a half miles from the big waterway.

5,000,000-Cubic-Yard Embankments.

In carrying the rail line across the low Gatun Valley and along the east shore of Gatun Lake it was necessary to construct several immense embankments in order to place the line above the lake-level. These embankments represent the tidy total of five million cubic yards, and perhaps as much more earth-moving was involved at the north end of Culebra Cut, where the line was specially located so as to furnish waste dumps for spoil from the canal.

The Panama Railroad, upon the new line of which $8,866,000 has been expended, may well be considered a model little system of its class—reenforced concrete culverts for all the small streams and all the other frills of the latest approved practise being observed—and yet its problems pale, of course, in comparison to those of our railroad builders who are ever reconquering the great West.

Only One Tunnel.

There is only one tunnel worthy the name on the Panama line, this being the one near Miraflores that has a length of 736 feet. Two steel bridges figure in the engineering achievements. One is a steel-girder bridge a quarter of a mile long, over the Chagres River at Gamboa, this bridge having one 200-foot through truss-channel span; and the other is the steel-girder bridge that carries the line over the Gatun River near Monte Lirio, this latter structure having a center span that may be lifted to allow to vessels access to the upper arm of Gatun Lake.

Like its prototypes in the United States, the transcontinental railroad at Panama has had its "land department," with the difference, however, that the railroad lands have been as a rule leased, rather than sold outright to new settlers. The towns of Empire and Culebra and other settlements along the line of the canal were located on land belonging to the Panama Railroad Company, and for years the railroad has enjoyed rentals of more than one hundred thousand dollars a year from its lands.

However, these lands have latterly proven a thorn in the side of the railroad managers, for the reason that in the old leases a stipulation was inserted to the effect that if the lease was ever revoked the railroad would pay the value of the permanent improvements that had been made. Under the new status whereby Uncle Sam has taken over the railroad

there has had to be a day of accounting with respect to many of these so-called improvements.

The railroad officials have contended that with the exception of some small plantings there have been mighty few "permanent" improvements; but under the terms of the leases a set form of arbitration has had to be followed, with the result that such a tangle ensued that the Congress of the United States, a little while back, had to pass special legislation relative to the matter.

Always Fit for Emergency Use.

The veteran railroad man who looks over the last annual report of the Panama Railroad and finds that with a net income of less than a million dollars it last year expended $2,341,000, or more than double the net income, for additions to and betterments of both plant and equipment, is likely to gasp in astonishment. The explanation, however, is found in the fact that, regardless of current revenue, the Panama Railroad must at all times be maintained in a state of the highest efficiency, ever ready for maximum use in an emergency. In short it is, as has been said, not merely a railroad but an insurance policy.

Herein we find the reason why of the up-to-dateness of the Panama Railroad—explanation of the fact that twelve out of its several dozen road locomotives are oil-burners; of its ninety-pound rails and cypress ties; and of the circumstances that all aerial signal-wires have latterly been supplanted by underground signal-cable forming a part of the underground transisthmian conduit line that affords an object-lesson worthy the attention of every man concerned with the despatch of trains by either telephone or telegraph.

THE TRAIN BUTCHER.

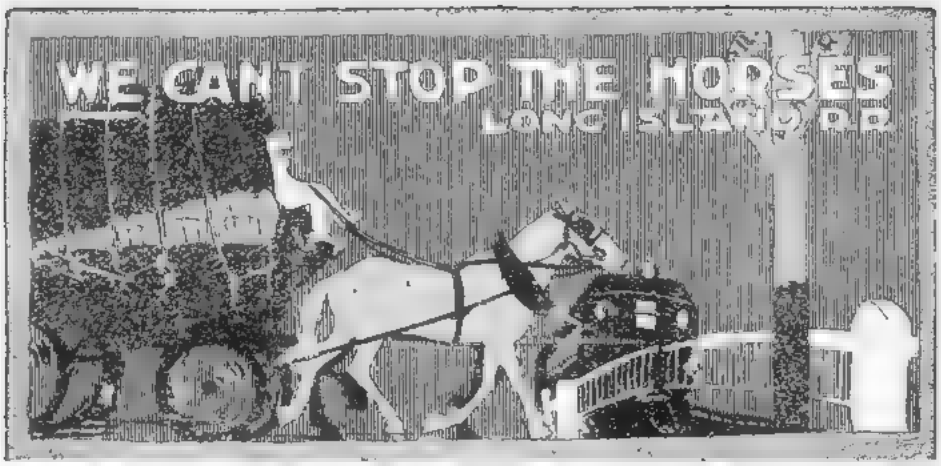
BY RICHARD WHITMAN.

OH, my lungs are brass as I slam the door;
You can hear me spieling above the roar.
While the pistons pop and the drivers sing
I bring to your seat 'most everything.
I'm leaving a junk-shop in your lap
While words stream forth from my open map:

"Candyapplesnutsoranges! Noosepaperspresssuntimesworld! Wafersmixed-candieschocolates!"

I'm bringing you everything that beguiles,
While the flier is eating the vanished miles;
You are bound to purchase, since I insist,
For I am a Simon-pure hypnotist.
So, while rails are clicking and joy stands pat,
I pocket your money for this and that:

"Cigarsandcigarettes! Bonbonsfigshamsandwiches! Latestmagazinesrailroad-manjustout!"



IN THIS POSTER THE LONG ISLAND RAILROAD INTIMATES THAT THE DRIVER HAS A PLACE IN THE SCHEME THAT HE ISN'T WORKING AT

RAILROAD AS PUBLIC RESCUER.

Nation-Wide Campaign to Save Motorists from Trying to "Beat the Train"—Long Island's Aggressive Fight.

ABOUT a hundred thousand automobiles are owned in the city of New York. The most tempting place for convenient drives and tours is Long Island. Hence the woes of the Long Island Railroad, which finds itself obliged to make more and more strenuous efforts to keep motorists from being killed at its crossings.

It has tried gates, bells, road-signs, and many other devices that may be employed at crossings, and now it is using the advertising columns of the daily newspapers in an attempt to persuade the motorist at

UNTIL GRADE CROSSINGS ARE FINALLY ABOLISHED THERE WILL DOUBTLESS BE STEADY MANIFESTATIONS OF THE ABOVE MANIA.

IT IS TO BE DOUBTED WHETHER EVEN JAIL WOULD DETER THEM. ANYTHING SHORT OF A SIEGE IN THE HOSPITAL IS INADEQUATE

his breakfast table that life is worth living. Attractive display advertisements of the poster type are used to show the helplessness of the railroad against reckless drivers.

Plowed through Crossing Gates.

All last year the Long Island made a campaign against harebrained drivers, but in spite of this the death and accident toll was amazing. The Long Island is a small road—its mileage is only 400—and the figures for last year, even after the campaign was in full swing, are appalling:

Eighty-two automobiles plowed through lowered crossing gates.

A crossing watchman who was warning a motorist was struck by the automobile, thrown sixty feet, and then run over and killed by it. The driver was sent to jail for ninety days.

Eleven occupants of automobiles were injured at grade-crossings.

Twenty-two drivers raced heedlessly to beat trains.

Thirteen drivers ran their machines against the sides of trains.

Eighteen drivers ran into and knocked

THE ONLY ANSWER TO THE ABOVE QUERY WHICH SEEMS REASONABLE IS AN EFFORT TO INSTIL SOME COMMON SENSE INTO THE NEXT GENERATION.

down traffic signs and lanterns which the railroad had put up expressly for their protection.

The story which the Southern Pacific tells is of the same tenor. Recently this system kept tabs on 17,000 drivers of motor vehicles at 34 crossings.

About 4,700 drivers, or 27.8 per cent, took the precaution of looking both ways before crossing.

About 475 took the half-precaution of looking in one direction only.

7 Motorists Out of 10 Take a Chance.

Nearly 12,000 crossed the tracks without looking in either direction.

In other words, seven-tenths of the drivers were willing to take a chance that a train would not be crossing at the same time. All they saved was the muscles of their necks. All they stood to lose was their lives.

Only two drivers in a thousand stopped their machines to have a look before crossing the tracks. One-fifth of all the cars crossed the tracks at reckless speed.

Drivers of teams also were careless. Only half of them looked in both directions before going across.

Of 6,300 pedestrians who were observed, one-half crossed the tracks without looking in either direction, and only a few more than a third looked both ways.

The Southern Pacific has tabulated the grade-crossing accidents on its lines for the last five years to learn the reason for them. Thirty-five persons of the persons killed didn't look both ways. One-eighth ignored not only the chance of a train's approach, but also the train's warning, the crossing-bell, and the flagman.

How They Died.

One-tenth of the killed were those who ran their cars into the side of the train. One-twelfth were persons who lost their heads on the crossing and stalled their motors. One-sixth of the dead belonged to that type of motorist that tries to beat the train to the crossing.

New Hampshire and Vermont have passed laws compelling the State authorities to maintain "caution-approach" signs on highways, about 400 feet from railroad crossings. In other States some of the railroads have put up such signs of their own volition, but these roads have found it hard to inspect signs so far off their right-of-way.

The effort to standardize crossing-protection in all its forms, which is being made by the American Railway Association, is expected to reduce the number of crossing tragedies. Yet it seems doubtful whether a man who will not look up and down a track which he is about to cross will be likely to pay heed to "caution-approach" signs or other forms of warning.

The old railroad appeal to "Stop, Look, Listen" is featured prominently by all the lines carrying on these campaigns of education. A recent poster issued by the New York, New Haven and Hartford bears it, as does a placard issued by the Denver and Rio Grande and distributed broadcast to garages, automobile repair shops, and to owners and chauffeurs in towns and cities lying along the line through Colorado, Utah, and New Mexico.

Must Wipe Out Grade Crossings.

This placard truly says that the loss of life in a single year is a shocking commentary on the public's contempt for the first law of nature, which is self-preservation.

Of course, the final solution of the problem will be the abolition of grade crossings, which work the railroads are prosecuting as fast as they are financially able. The Long Island Railroad has been steadily prosecuting this improvement for fifteen years, though its line runs wholly over a flat country.

The most practical form of crossing-protector is the gate, yet the experience of the railroads has been that the mad motorist is not always stopped by wooden bars. He goes right through them in his anxiety to get somewhere.

RAILROAD CRANE THAT WORKS.

GIANT MECHANISM WEIGHS 235,000 POUNDS AND CAN LIFT 300,000 POUNDS

THERE are two kinds of cranes. One stands around on one leg and catches frogs. The other works.

If it is built for a railroad, like any other unit, human or mechanical in the scheme of the steel span, it works all the harder. Here is the picture of a regular Sandow at its labors.

The railway crane illustrated here horns into the scheme with all the requirements that a healthy, lusty, two-fisted crane should possess to really earn its weekly pay-envelope.

It weighs a little matter of two hundred and thirty-five thousand pounds. It can lift more than its weight—just a small item of three hundred thousand pounds, that's all—and never turn a hair.

The striking characteristic of a big baby of this kind, from the standpoint of the interested if ignorant layman, is the matter-of-fact way in which it tackles its assignments. If one may be permitted to explode in near verse:

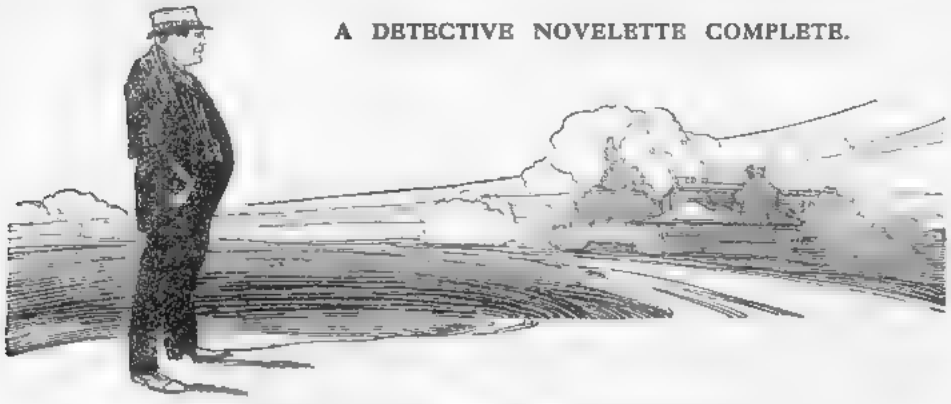
'T will handle a ton with the greatest of ease,
And the succeeding tons are as light as two fleas.

The crane shown here is a favorite to employ for heavy wrecking-work. When engaged in this service, inaccessible pieces of equipment or wreckage are now often yanked from the pile by this method: The jib is set at right angles to the crane, taking hold of the load, and the crane and load are then dragged out by a locomotive.

This giant crane, too, must be able to travel at a high rate of speed. A wreck occurs wherein the débris of two trains dimples the scenery. Every second that line is tied up means much money to the railroad. So these cranes are made for fast traveling, because of a low center of gravity and the improving of the weight distribution, eliminating any pitching tendency. They can travel under their own power if desired.

MR. TOM HILL ASSISTS.

A DETECTIVE NOVELETTE COMPLETE.



BY CHARLES WESLEY SANDERS,

Author of "On the Wings of a Warning," "Barehanded McLaren," "The Shadow of Disaster," "Sleuth 'Morse' Plugs a Circuit," etc.

CHAPTER I.

AN EARLY-MORNING PHONE-CALL.

I GUESS my telephone must have been ringing for quite a spell before it woke me up. When I did finally drag my eyes open, it was whirring away to beat a full house. I supposed it was Sunday morning some time then, for I hadn't got to bed till near midnight Saturday night. A bunch of hoboes had drifted over from Crestline with a bottle apiece about nine o'clock, and I had had to wait for near two hours before they got drunk enough so I could lock them up for being soused.

It was bums mostly that broke my rest. Our town is dry, and my jail trade is generally transient, being made up of these floating booze h'isters that gets kicked off freight-trains.

First step I couldn't figure out what the telephone-call was, for I do all my business before midnight as a rule. Before I took the receiver down from the hook I stood listening for a minute between the bell's jangles.

But there wasn't a breath of sound out of doors. The Sunday silence had already settled down on the village, and that is some silence, I'll say. Everybody stays at home all day except when they tiptoe off to church and back.

I took down the receiver and said, "Hello." I didn't get any answer for a minute more, and, "Well?" I said louder.

"Is this Mr. Tom Hill, the town marshal?" said a voice.

"That's me," I said.

There was another silence. I begun to get mad. It was midsummer, and the sun would be peeking up before long and the birds twittering in the eaves of my house. I wanted to get some more sleep in the dark. I was just going to let out a man-sized holler when the voice came again.

"Come up to Mr. Sherill's. Come at once. There is something the matter up here."

I recognized the voice then. It belonged to William Sherill's valet, George Martin. He was the only one of his species in the village, and his voice was different from anybody else's. It was a smooth, whispering voice, and it fitted him to a T.

Martin was a pussy-footer, all right. I guess the only person in the village he had ever talked to was old Sherill, and he never said nothing but, "Yes, sir," and, "No, sir," to Sherill. He never stirred out of the big house on the hill except to run an errand for Sherill

"What's the matter, Martin?" I said. "What do you want me for? House on fire—or burglars?"

"I can't tell you over the telephone, Mr. Tom Hill," he said. "Just come. Come at once. I will wait for you at the front door."

Then he clicked up his receiver, leaving me standing with my receiver in my hand, there in the dark with nothing on but my night-shirt.

I've been town marshal for twenty years, and I know everybody in the township. I've kept the village free from bums, stopped fights and runaways, given folks advice about loans and mortgages, settled disputes when I could, and played seven-up with three generations.

But I had never been called to the Sherill house before. Outside of the Sherills we're a common bunch. Sherill had built him a big house when he kind of cut down on his business in the city, and he had never really become a part of us.

So by the time I got the lamp lit at the side of my bed I had guessed myself wide awake.

Don't go picking me for one of these here tin-star marshals with a squeaky voice and a bunch of second-growth whiskers. I weigh three hundred pounds, got a voice like a fog-horn, and shaved every morning when it was the fashion in the best society to keep down the high cost of barber-bills.

When I got the light going I saw it was two o'clock in the morning. I cussed a little. By the time I got to Sherill's and back, do my best, it would be daylight. It looked like I was up for the day unless somebody knocked me down, and that hasn't never happened yet.

I was glad for one reason it was Sunday morning. I had taken my bath the night before and laid out clean shirts and my Sunday suit. I wouldn't lose any time by hunting for my clothes, so I wouldn't be ashamed to appear in the Sherill house.

I have never been married, I own my own place, and I keep a cow and pigs and chickens. So I can dress with the best of them. I've bought a new suit spring and fall for many years. They're tailor-made, too. On account of my size I'm a fright when they try to drape a hand-me-down on my buxom figure.

I locked my front door behind me and started to peg up the hill toward Sherill's. It was a fine moonlight night, or rather morning, with a bit of soft breeze whispering among the trees along the walk. Flowers with the dew on them were in all the front yards, and they threw out their smells to me as I passed.

Them same kind of flowers had been in them same yards to my personal knowledge for nearly fifty years. They didn't seem to have changed much from the time we had moved into the house where I now live when I was a boy of ten. Thinking about them things, as a man will when he's out alone at that hour, I kind of forgot about the Sherills.

After a while I come to the end of the sidewalk and I stepped out on the concrete roadway. Already I could see the Sherill house, the bulk of it lifting up into the silver moonlight. On the side that was toward me there was no light, and I stopped my mooning and began to wonder what had happened up there.

Probably something that didn't amount to nothing, I said.

The worst I could imagine was that one of Sherill's machines—he kept three—had been stolen. Some cars had been stolen in other neighboring villages, but none in ours. I got a reputation that makes the crooks hesitate about pulling anything off.

I had got half-way up the hill when I heard the sound of an auto horn back

of me. I looked around and saw a long, low car just beginning to take the hill. I knew that car in a minute. It belonged to Harry Sherill, old man Sherill's son. I had known Harry ever since his father had built the big house. He had been a harum-scarum lad of sixteen then. There wasn't anything bad about him; he was just wild, like a blooded colt.

And he was a mixer—not a bit like his dad. He hadn't been in the village a week before he knew everybody. He was a brown-eyed kid then, with a shock of corn-colored hair.

Now he was a strapping big man with his first vote tucked safely away in his vest-pocket. Him and me was the best of friends, for I like nerve in any man, and Harry had nerve.

The only time we ever fussed was when I had to caution him about running that long, low car. Other ways he was sort of easy-going, but the minute he got the wheel of that car in his two hands he was in a breakneck hurry to get away from where he was.

In a jiffy he was alongside of me. He had made out who I was, of course, and he run that blamed car so close to me he just grazed my pants-leg. As he swept past me I could see him duck over the wheel, and I knew I was getting the laugh. At the top of the hill he stopped and waited for me.

"You trying to run over me?" I asked gruffly.

"Why," he said, "I didn't come within half an inch of you, sheriff."

He always calls me sheriff. I called him for that first time he sprung it, but he only said if I wasn't sheriff of the county I ought to be, and he'd see that I was as soon as he was able to vote.

"Where you going?" he asked me. "I'll take you any place between here and yon rising sun."

"I'm going up to your house," I said.

"Going to pinch the old man?" he asked.

I told him about the telephone-call. He got a little white about that. He looked at me for a minute and then his eyes traveled to the big house.

"You don't suppose anything has happened, do you?" he asked.

"Oh, nothing serious, son," I said. "You go along in and I'll follow you."

He started the car slowly. When I got up to the front door he was standing there, waiting for me. I forgot to say there was another lad in the car. Harry introduced him to me now.

"Mr. Tom Hill," he said, "this is my friend, Irvin Wheeler. He's going to visit me for a week or so. We come down from the city after the show. What do you suppose is the matter, sheriff?"

"You better ring the bell," I said.

I seen that the man in the boy was beginning to stick out. He was quieter than I'd ever seen him before. And he looked a good five years older. It kind of pleased me, for I liked him and I knew that under his smiles and kidding ways there was good stuff. A little bit of worry was bringing it out already.

He put his finger on the push-button. Wheeler stood up beside him, and I says to myself there's a pair of good lads. Wheeler, who was a big, husky six-footer with a broad face like the cook's at the hotel, was standing by Harry to see what was going to be pulled off.

Pretty soon the door-latch clicked. There hadn't been no sound back of the door. A man could turn handsprings on one of them rugs in the Sherill house, I'd heard tell, and make about as much noise as if he was counting feathers.

The door was opened slow, and the servant, Martin, peeked out. When he saw who was there he just stood still, opening the door no further. I seen his Adam's apple go plumping up and down like he was trying to swallow the apple.

"Oh, Mr. Harry," he said at last.

"Open the door," said Harry.

Martin pulled the door open. Harry shoved his way in, and me and Wheeler followed him. Martin stood back. His face was pale and he rubbed a shaky hand over his face.

"Where's father?" Harry asked.

"He's—he's in the library, sir," Martin answered.

"What's the matter with him? Is he ill?"

Martin only stood there, staring at the lad. I see that something was wrong. I stepped by Harry and started for the library door. But Harry caught hold of me.

"Wait," he said. "If anything's gone wrong, I'm the one to go in."

He pushed past me and walked to the door. He took a half-minute to get himself together; then he shoved up his head and opened the door. He went inside, closing the door after him.

The three of us stood in the hall waiting. Martin kept his eyes glued on that closed door. Pretty soon Harry opened the door and stepped into the hall. He fixed his eyes on Martin.

"Who did this?" he asked.

If I had had my eyes closed I'd almost have believed that it was Harry's father speaking. I'd never heard the boy talk like that before. His voice was hard and sharp—and suspicious.

And I'll say that that boy had never been suspicious about nothing before. Whatever had happened back of that closed door, it was something that had put iron into Harry's soul.

"I don't know, sir," said Martin, and he straightened up slow like he was lifting a ton weight.

They stood looking into each other's eyes for quite a space. Then I thought it was time for me to take a hand.

"What's the matter, lad?" I said.

For answer he stood away from the door and jerked his head for me to go inside. I went in, shutting the door behind me as Harry had done.

Outside the gray dawn was beginning. In the room the blinds was half-way up to let the air in through the screens, and the faint light come filtering in. Above the big table in the middle of the room the electric lights were still burning. But with the coming daylight fighting the electrics it was all sort of grayish in the room.

I stood by the door a minute, peering around. And just then beyond the table I made out Sherill. He laid on his face with his arms crumpled up under him. I walked over to him and touched his cheek. It was like ice. I lifted him so I could look at his face. There was a bullet wound just in the front of his temple. I judged he had been dead for quite a spell.

CHAPTER II.

SCENTING THE TRAIL.

I WENT to the door and called to Martin. He came into the library with his eyes half shut. He didn't look at the man on the floor. Harry came to the doorway. His friend followed him.

"You better go out and get a bit of air," Wheeler said.

"I'm all right," Harry said.

He crossed the room and pulled a big chair away from the table. He sat down in it, not more than a yard from his father. Then he bent over, his hands clasped together between his knees. He looked like he was on guard over what was left of his father.

"Martin," I said, "what do you know about this business?"

"Not anything," Martin said. "A while before I telephoned to you I came in here to see if Mr. Sherill wasn't going to bed. He hadn't been feeling any too good for the last few days, and, even when he was well, I never knew him to sit up so late. I thought he might have fell asleep. He was lying just like you see him."

"Did you see any weapon?" I said.

"Yes, sir," said Martin. "I put it back in the table drawer."

Harry jumped up and pulled open the table drawer. On top of some papers lay a pistol. Harry pulled it out and handed it to me. I broke it and found one chamber had been discharged.

"Whose gun is this?" I asked Martin.

Martin turned his eyes on Harry. Harry was staring at the weapon.

"It isn't possible," he said.

"Whose gun is it?" I said to him.

"It was my father's," he said. "He always kept it in that drawer."

"Where was the gun when you found it?" I asked Martin.

"It was lying right here," Martin said, and he pointed to a spot near the door.

I measured the distance with my eye. It was a good seven feet. I looked at Harry and shook my head.

"No, lad," I said, very confident, "your dad didn't kill himself. He couldn't have shot himself and thrown the gun away over there. Did you find anything else, Martin?"

"Yes, sir. That cigar and match on the mantel."

I walked over to the mantel and picked up a long, black cigar and a match that hadn't been lit. It was the kind of cigar Sherill always smoked, a kind he had made especially for himself. He was a strong man, and he liked a cigar with a punch to it.

"Where was they?" I asked.

"They laid on the floor near the grate," Martin said.

"Well," I said, "I can tell you about how this happened. Mr. Sherill got up to light a cigar. Somebody shot him just as he was about to strike the match."

"With his own revolver," Harry said.

"With his own revolver," I said. "And so it must have been somebody that knew about the gun beforehand—somebody that was familiar with things in this house

I shot a look at Martin then. He had come out of his panic some and he looked back at me steady enough.

"Who was here to-night, Martin?" I said.

"Only myself and Mr. Sherill's stenographer—in this part of the house," Martin said.

"You mean Miss Alice Milroy?" I said.

At her name Harry jumped up.

"That's foolish," he said. "Don't try to bring Miss Milroy into this, sheriff."

"I ain't trying to bring anybody into it, son," I said. "But we got to get the facts. Martin, you go on and tell what you know."

"At eight o'clock Mr. Sherill had me telephone Miss Milroy to come to the house," Martin said. "He said if she could come to send the car for her, and I did. It was about eight-thirty when she got here. She was with Mr. Sherill in the library till a little past nine. Then she come out and got into the car and went home.

"When she come out of the library she had her note-book and fountain-pen in her hands. I suppose she was taking some dictation. On account of him not feeling well, Mr. Sherill didn't go to town yesterday, and I suppose he had some letters to get off in the evening."

"After Miss Milroy went what did you do?" I asked.

"Just as soon as she was gone, Mr. Sherill rang for me and I went to the library," Martin answered. "He had me get him a glass of wine."

"Well, that lets Miss Milroy out," Harry said, and there was a kind of a sigh of relief in his voice.

"Yes, sir," said Martin. "That certainly lets her out."

"Did Miss Milroy ever come to the house in the evening before?" I asked.

"No, sir," said Martin. "She never did. Mr. Sherill had always been in the best of health before. Miss Milroy boarded here in the village, and went to and from the city with Mr. Sherill. Mr. Sherill seemed to think a lot of her. Once when I went to town with them in the car, they talked over his business like she was his partner. She is a very smart young woman."

"Well, after you got the glass of wine for Mr. Sherill what did you do?"

"He said he wouldn't want me for a while. He said he would ring. He asked me if Mr. Harry had come in yet. I said

he hadn't. Then I left and went to my room and read the paper that Mr. Sherill had given me after he got done with it. He didn't ring for a long time, and then, as I told you, I come down to see if anything had happened to him. And I found him like I told you."

"And there's been nobody here to-night except Miss Milroy?"

"No, sir. There hasn't been nobody."

I walked around the room and examined the windows and the doors. The windows hadn't been touched. They was up—all of them—to let in the air; but the screens run the whole length of them and was fastened on the inside. Nobody could have got into the house through the windows, and no shot had been fired through the screens. Anyway, the gun had been in the room after Sherill was shot.

"Where was the other servants?" I asked Martin.

"They were all in their rooms in the wing," Martin said. "None of them ever came into this part of the house except the maids to do their work in the morning."

I turned on Martin and stared at him for a full minute without saying anything.

"Martin," I said at last, "did you shoot Mr. Sherill?"

Martin's eyes still kept the mild look that come into them after his first fright. He didn't try to bluster or be insulted.

"No, sir," he said, very calm. "I didn't shoot Mr. Sherill. I been with Mr. Sherill for fifteen years. As Mr. Harry knows, he trusted me. I had a good, easy job, with good, steady pay. There wasn't no reason for me to kill him. It's only lost me my job, I suppose. And jobs like this ain't so easy to get at my time of life."

That seemed simple enough, but it didn't throw any light on the shooting.

"There wasn't any chance of Miss Milroy coming back and Mr. Sherill letting her in after you went to your room, was there?" I asked.

Martin sort of jumped, like I had flicked him with a whip.

"Why—why, sir—" he stuttered. "No, sir. I don't think she came back."

"Well, could she of rung the bell and you not heard it and Mr. Sherill of let her in?" I asked.

"Well, yes, sir, that would be possible," said Martin. "But I don't think it was likely. The chauffeur was back in a few minutes. Miss Milroy would have had to walk back. It isn't likely she'd do that. Anyway, she's in the same fix as I am. She's lost a good job. What'd she gain by Mr. Sherill being dead?"

I turned to Harry. He was sitting down again, his eyes fastened on my face. I only wanted to question him, because it's a kind of rule to question everybody when you get up against a game like this.

"Harry," I said, "you come straight from the city in your car, did you?"

"Straight from the city," he said.

"Didn't stop no place?"

The blood climbed up into his face. He laughed kind of nervous.

"When we came to the road leading down to the station, I stopped and walked down there," he said. "Irvin stayed in the car. I was gone about ten minutes."

"What did you want to go to the station for?" I asked.

"I thought I'd send a telegram," he said. "I've been playing the market a little since it got so vigorous lately, and I wanted to send a wire to my brokers in the city."

"Did your father know you was playing the market?"

"No, sir, he didn't."

"Did you win, Harry?"

"I've got about fifty thousand dollars to my account now," he said.

I shook my head at him.

"Your father wouldn't have liked that, son," I said. "And you know you've grieved him considerable with some of your pranks."

"But father and I had made up everything," Harry said. "We had come to a complete agreement. We hadn't got along

so well together in years as we had in the last few months."

"Well, after you sent your telegram, what did you do?" I asked.

Harry twisted his hands together and the color went out of his face.

"I didn't send any telegram," he said. "I suddenly remembered that to-day was Sunday and that it would be no use."

"My Lord, boy," I said. "You're sure you wasn't gone from that car more than ten minutes?"

Harry turned to Wheeler. Wheeler was standing by the table. He had his arms folded over his big chest. He was as cool as an icicle.

"How long was it, Irvin?" Harry asked.

Irvin turned to me with a quick move of his head.

"This is rather ridiculous, isn't it, sheriff?" he asked. "You don't suppose Harry came up here and killed his father, do you?"

"I don't," I said. "How long was it, son?"

"Well, it was exactly sixteen minutes," Wheeler said. "I know, because I looked at my watch when Harry left and I looked at it just before he came out from beneath the trees. Just exactly sixteen minutes it was."

"What did you do when he came back to the car?"

Irvin Wheeler flushed up a bit at that.

"We sat in the car for maybe fifteen minutes more, talking," he said.

"So thirty-one minutes went by from the time you drove onto the pavement till you started up the hill."

"Yes, sir."

"What was you talking about down there in the village?" I asked.

"It was something purely personal to Harry and me," said Wheeler, and he shot me a glance that had a glint of fire in it.

"Well," I said, "we'll notify the coroner, and then we'll go down to the village and have a talk with Miss Milroy."

Harry jumped up.

"The car is still outside," he said. "I'll run down and get her. I'll have her up here in a few minutes."

I stared at him. He was a shade too eager.

"No," I said, "we'll go down together after I phone. And I'll talk to the girl by myself."

Harry's head flew up. He was mad all of a sudden.

"What do you mean, sheriff?" he asked. "What're you hinting at?"

"Not anything," I said. "But I'm the marshal, you remember. I'll just have to conduct this case the way I want to."

"Very well," said Harry, and I saw a glance travel between him and his friend, Irvin Wheeler.

It was a scared glance with a question at the end of it, like the knot tied in the end of a kite's tail.

Them two lads had me putting myself through the third degree as we went down the hill in the long, low car.

CHAPTER III.

"SHUCKS!"

"WHEN you get to the place where you stopped the car, while you went to the station, stop there again," I told Harry.

He gave me a queer look, but he did as I bid him. The sun was edging up over the horizon and flooding the village with its strong light when he drew the car up.

"It was just here," he said.

"And where did you go?" said I.

"I went down that street, halfway to the station," he said, pointing. "Then I recalled it was Sunday and come back."

"Where does Miss Milroy live?" I asked.

I asked the question without thinking twice about it. I merely wanted to know how to locate the girl. But somehow it seemed to hit Harry plumb between the eyes.

"Why," he stuttered, "she lives down that street, halfway to the station."

I heaved myself around in the seat to look into his face. He was staring down the street with a frown cutting deep between his eyes.

"About where you stopped," I said.

"Right where I stopped," he said.

"Well, you can just drive down there," said I. "And, Harry, it won't get you anything to be fresh with me. I don't have to stand for it."

"I'm not trying to be fresh, sheriff," he said.

He drove the car down to a two-story brick house, setting back from the road in the midst of an old-fashioned flower-garden. Except in a room up-stairs the window-shades was all drawn and the windows closed.

I stood up in the car and opened the gate next to me. Harry put a hand on my arm.

"Say, sheriff," he said, "this is kind of rough business for a young girl like Miss Milroy. What're you going to do—call her to the door and tell her my father has been murdered and ask her if she did it."

"I thank you for the compliment," I busted out. "I'll try not to be any more of a roughneck than I have to."

I eased myself to the ground at that and started toward the front door, but Harry called after me:

"Say, sheriff! Let me tell her first, won't you?"

Under ordinary circumstances I would have let him, but I had a hunch he was keeping something back from me. His statement that he had gone to the station—or started there—sounded phony to me. It was funny that he had got as far as the girl's house only.

"Stay where you are," I said.

I clanged the old bell on the front door and a noise like a church bell makes went through the house. Pretty soon the Widow Myers, who I knew, opened the door. She had a fork in her hand, and I knew she had just come from the kitchen. The sight of that fork made me hungry, but I had my duty to do.

"Mornin', Mrs. Myers," said I. "I'd like to see Miss Milroy for a minute."

Widow women who keep boarding-houses usually go to pieces when the marshal shows up in the early dawn, but Mrs. Myers was no book widow. She'd set up too many nights waiting for Tom Myers to come home. Tom was usually late, because he covered two miles of ground to go forward half a mile. Half the time after dark you'd never know whether he was backing up or going ahead.

So Mrs. Myers only said:

"All right, Tom. Come in."

I went into the dim parlor, and Mrs. Myers went to the bottom of the stairs and sang Miss Milroy's name up them. A door opened and closed and a sweet, coolish voice came floating down:

"Yes, Mrs. Myers."

"Mr. Tom Hill, the marshal, wishes to converse with you," said Mrs. Myers, trotting out her company words.

"Very well," said the voice.

I heard a swish down the stairs and Miss Milroy, dressed all in white, stood in the doorway. She stood peering in at me for a minute, her head kind of shoved out. I noticed what a white, smooth neck she had and what a big bunch of brown hair. I'd never seen her with her hat off before.

"You wished to see me, Mr. Hill?" she asked.

"Yes, ma'am," said I. "Will you come in and sit down?"

She come into the room, and I remembered my own manners enough to get up, but I set down again as soon as she did. I'd rather have stood up in front of a runaway horse than her just then. I wished for a minute I had let Harry come in and tell her, but, of course, I had to remember that I'd have to tell all I did on the witness stand later. So I bucked up and turned to her.

"Ma'am," I said, "I have a few questions to ask you—a few distressin' questions. I'll make them as brief as I can."

"Has anything happened?" she asked.

She had one of them voices that come

out thick like syrup in cold weather, and I could see her eyes shining at me. Before, I had only seen her at a distance, but now I knew she was far and away the prettiest girl in the village.

"Ma'am," said I, "you were in the employ of Mr. William Sherill, wasn't you?"

"I was his stenographer, yes," said she.

"When did you see him last?" said I.

"Why, last night," she said. "Has anything happened to him?"

"Where did you go when you left the Sherill house?" I asked.

"Why, Mr. Sherill had me brought home in one of the cars," she said. "I came straight home."

"And what did you do when you got here?"

"I sat in my room for quite a long time reading."

"Who did you see after you left the Sherill home—besides the driver of the car."

She stuck on that for a minute, and I don't know why I got a kind of a quivery feeling around my heart. I knew I liked this little lady already.

"Why, Mrs. Myers was in her room," she said. "I didn't see her."

I've been at hundreds of trials where the sharpest lawyers in this country has fought out cases. So I kind of know when an answer is what the lawyers call evasive. Miss Milroy wasn't answering me straight from the shoulder. I was sorry.

"Ma'am," said I, "you and Martin was the last persons to see Mr. Sherill alive—"

"To see him *alive?*" she busted out. "He isn't dead?"

She was on her feet and took a couple of steps toward me. In thinking about her, I had forgot I hadn't told her Sherill was dead.

"He's dead," said I. "He was murdered some time last night."

She didn't cry out or look like she was going to faint or anything like that. She just stood there staring at me.

"Why," said she, "it's incredible."

"It's a fact," I said.

She come around the center table and stood before me. Her eyes had a worried look now.

"Does Harry know?" she whispers.

"He's outside in his car," said I.

She put her hand up to her heart then and heaved a sigh.

"Poor boy!" she said. "Poor Harry!"

"Ma'am," said I, "excuse me, but you haven't answered my question."

"Pardon me," she said, kind of breathless. "What was it?"

"Who did you see after you left the Sherill home?"

She dropped down her long, silky lashes and stood looking at the rag carpet. The question seemed to trouble her.

Finally she lifted up her head and she seemed to be ready with an answer. But before she could come out with it, the front door opened and banged shut. Harry come busting into the room.

"Alice," said he, "don't say anything more."

He turned to me, and I could see that he was all a-quiver with excitement.

"Pardon me, sheriff," he said, "but you know Miss Milroy ought to have counsel before she tells anything she might happen to know. Have you warned her?"

It was my turn to stare. What was the lad driving at?

"Warned her?" said I. "Why, son, you talk like somebody was accusing her of having murdered your father! Nobody has—least of all me. I was just connecting up the links that all you people has furnished. I don't suspect Miss Milroy any more than I suspect you. She's too nice a girl."

Miss Milroy blushed at that, even if it did come from a sixty-year-old that tips the beam at three hundred.

"So now, Miss Milroy," said I, "who did you see—if anybody?"

Well, I was clean disappointed in that sweet girl. I'd expected she'd come right out with a statement that she hadn't seen nobody. But she balanced herself first on one foot and then on the other and said:

"Really, Mr. Sheriff, I must decline to answer."

It made me kind of mad. I haven't got no patience with mysteries. A little common sense will clean up most of 'em. And here was a nice girl making things dubious for nothing.

"Why," I blurted out, "if you met a beau here or went out to meet him, you ought to say so. It wouldn't be against you, and it certainly wouldn't be against the man. Was it by any chance Mr. Harry Sherill?"

It looked like I had dropped a baby bomb into the room without knowing it. The girl whirled around on me, and her face was the color of one of Widow Myers's roses outside the window. She started to jump at me, but Harry cut in.

"That's foolish, sheriff," said he. "I don't admire you any for suggesting such a thing about a girl like Miss Milroy."

"Shucks!" said I. "I don't see nothing wrong in it. Miss Milroy's as good as you are, and you think you're as good a man as ever put his feet on the good green land."

"Well, you'll kindly discontinue your questioning," said he.

"Very well," said I, getting up. "But you'll find the county prosecutor has got more curiosity in his manicured little finger-nail than I have in my dwarfed body. We may as well be going."

"Come on, then," said Harry. "Alice," he said to the girl, "I'll see you later. We'll have to have counsel. I'll get a good lawyer."

He was out of the room almost while he was talking. Miss Milroy followed me to the door. She put one of her little, slim hands on my arm. I looked down at her, as she lifted up her face to me.

"Sheriff," said she, very gentle, "don't be cross."

Well, I had to smile down at her, though I was a little put out.

"Shucks, child!" said I. "I'm not cross at you. If that fool boy had kept out you and me would have got along first rate. Anyhow, you just remember that Tom Hill has been a lifelong friend of yours. And I may say it as shouldn't, but you might go further and do worse. Man and boy, I've lived in this village all my life. My word goes with everybody hereabouts. You ask 'em."

"I don't need to," she said. "I can see that."

We shook hands like old-timers, and I went out to the car. I believe I could have got married myself when I was younger if I'd thought I'd have a daughter like that.

"Climb in, sheriff," said Harry as I got to the car. "I'm going down to the station."

"Going to send that wire to your broker, are you?" I asked, kind of mad at him for butting in on me and Miss Milroy.

"No," said he, "I'm going to wire for Arnold Sage."

"And who," said I, "is Arnold Sage?"

Harry gave me a sidelong glance as if he was surprised at my ignorance.

"Why," said he, "Arnold Sage is one of the best-known of modern detectives. I'm going to hire him to take charge of this case."

"One of them thumb-print guys?" I asked.

"Thumb-prints?" Harry said. "I should hope he had passed beyond the thumb-print stage. He's a scientist—a man of wide reading and wide knowledge. He's studied criminology in all the great foreign centers. He'll go at this thing in a scientific way. It's lucky I can avail myself of his great ability."

I didn't know whether to laugh or to swear. The idea of getting one of them book detectives on this job. But at last I only said: "Shucks!"

CHAPTER IV.

MR. ARNOLD SAGE, BOOK DETECTIVE.

MR. SHERILL was buried on Monday. Arnold Sage come down to the village on Tuesday. Meanwhile I

had been nosing about a little on my own account.

Harry telephoned me Tuesday morning to come up to his house and meet Mr. Sage. I had a notion not to go, but Harry begged me to do it, and so I did.

I expected Sage would be one of these wise guys who would look down on a town marshal. So I had it sticking up in my neck good and hard when I rang the front-door bell. I had made up my mind that I would set with a padlock on my mouth if Mr. Arnold Sage started to get funny.

But Sage surprised me. He surprised me in every way. He was a quiet little chap, younger than I had expected him to be. I expected he would be pulling at a coffin nail when I went in, but he was puffing a pipe almost as big as his fist.

He stood up in a cloud of smoke when Harry introduced us. I don't suppose he weighed more than a hundred and ten pounds and he wasn't above my shoulder in height.

"H'are you, Mr. Hill?" he said. "Mr. Sherill has asked me to come down here to work with you on this case. But I don't want you to think I'm butting in."

That kind of took me off my feet. I had expected him to shoot a lot of language that would tangle me up, and here he was talking plain U. S. A. just like myself.

"Oh, that's all right," said I. "You can butt right in as far as you like. I guess you got it on me when it comes to doing any real detective work. I'm only a village policeman."

Sage didn't deny that. He just sat and puffed a minute, his eyes half-closed. Then he got up and knocked the ashes from his pipe.

"Now, Mr. Sherill," said he to Harry, "if you'll just leave us alone for a bit we'll have a little talk"

Harry got up, but he was none too brisk about it. As he went out the door he shot a look at me, kind of appealing. I slipped him a wink, and just as I done it Sage turned around suddenly and caught me. It didn't seem to feeze him none, though.

"Well," said Sage, when the door had closed on Harry, "what do you think? Got any idea who killed Mr. Sherill?"

"If I had," I said, kind of sore because he had caught me tipping Harry the wink, "I'd have made a pinch before this."

"You might have a hunch or two without having enough to make a pinch," said Sage.

"Well, there's several things that mystifies me," I said, "but none of them is a big enough peg to hang anything on."

"I have talked to all the servants in the house," Sage said. "We can eliminate them all but the man Martin. To him we can add Harry Sherill, Miss Milroy, Mr. Wheeler -and any one else in Europe, Asia, Africa, and North and South America."

"And Miss Helen Squire," said I.

Mr. Arnold Sage filled his pipe. But he didn't fool me as he sat there shoving the tobacco down into the big bowl with his thin finger. I had got his number. He was quiet and deep all right. If I'd confessed then that I'd killed Sherill I suppose he'd have asked me for a match first thing he did.

I leaned back in my chair and twiddled my thumbs while he got the old pipe to going.

"And what about Miss Helen Squire?" he asks.

"You understand that I've lived here all my life," said I. "I know everybody. I've known Miss Squire since she was in swaddling clothes. Well, she and Irvin Wheeler have got a love affair well started, judging from what I observed under the summer moon last night."

"That's interesting," said Sage. "Fire ahead"

"Miss Squire," said I, "is the village belle. She's prettier than any actress that was having her picture took by a photographer that knew his business. She's the only daughter of old Joel Squire, dead these five years. She's got about

half a million bucks in her own right. She's been through a couple of colleges and studied music in Europe.

"Old Joel Squire and Sherill was bosom friends, through doing business in the city together. They agreed long ago that Harry and Helen should marry when they was old enough."

"You're sure about this, Mr. Hill?" Sage said.

"I'm sure," said I. "You know, the older stuff gets to be the more likely it is to be true. I didn't read that in no paperback novel."

At that yours truly got a laugh out of Mr. Arnold Sage. It wasn't what *I* would really call a laugh, because it sounded like a bundle of dead leaves being stirred by a tired wind. But I felt it was considerable to come from Sage.

"Well," said he, "it wouldn't be unnatural for two men like Sherill and Squire to want their children to marry, if the two men were good friends."

"What's more," said I, "Harry and his dad never got along very well together. Sherill never told Harry nothing about these nuptial arrangements, but he told me. That was one night when Harry stayed out till the little birds was ringing their bells for breakfast.

"The old man come to me about dawn and wanted me to find the boy. I went down to the railroad and saw him hop off a freight. He'd been to the city. I took him home and the old man kept him there till he read Harry the riot act. Harry just sat still, staring straight at his dad.

"'Is that all?' he asked, when the old man had finished.

"'That's all,' the old man said, and Harry beat it.

"Did you ever hear of other troubles between them?" Sage asked.

"It has always been common talk that Harry was wild. He never got drunk nor nothing like that, but he just seemed inclined to have his own way. The old man told me once he couldn't get Harry to do nothing unless he told him to do the opposite."

"Stubborn," said Sage. "Self-willed."

"Well, he didn't have nothing on the old man there," I said. "The old man wouldn't play in no game unless he made the rules."

"It's a common situation," said Sage. "Go on."

"Well," I said, "there ain't much to go on to. Sherill wanted his son to marry Miss Squire. Harry brings Irvin Wheeler down here and Irvin begins to make sudden and open love to Miss Squire. I learn it's been going on for some time. Wheeler has been down here half a dozen times at night to visit Miss Squire. Nobody knew about it—not even me. What'd the old man say if he found that out, Mr. Sage?"

"I should judge he'd be furious."

"He'd be red-headed," I said, warming up to my theory, though till just then I didn't know I'd had any theory. "And he'd jump Harry and Harry would jump right back. There'd be an awful scene. Anything might happen."

"Harry might have killed his father, you think?" said Sage.

I wiped away the sweat. I was getting so interested that it was oozing out of me.

"You know how far two hot-headed men like Harry and Sherill would go once they got started," I said. "The old man was killed with his own gun. Supposing Harry went to the library to have it out with his dad. Suppose his dad pulled the gun from the drawer and Harry jumped him. Harry might shoot the old man before he knew what he done."

"Precisely," said Sage. "But you must remember that Harry was away in his car at the time the murder was committed."

"Is that so?" said I. "Well, he wasn't so very *far* away in his car. The car stood down the street here for thirty-one minutes some time that night. Harry says it was late, but it might have been any time. The town was locked up for the night before Sherill was killed.

"Harry says he started for the station to send a telegram but changed his mind.

I can walk from where the car was to the station in a couple of minutes. Harry didn't go all the way, and yet Wheeler says he was gone sixteen minutes by the clock. What was he doing, do you suppose?"

"Would he have had time to get up here to the house?"

Well, I thought I had a laugh coming to me then and I let her go. And, believe me, it wasn't no dry-leaf chuckle neither. When I laugh, I laugh.

"That ain't the point," said I.

"What is the point, then," said Sage, and I could see I had him kind of puzzled; and me a town marshal and him famous for solving mysteries.

"The point is—the big point is—that Harry ain't telling the truth," I said.

"Quite so," said Sage, pulling hard at his pipe till his face was hid in a cloud of smoke. "Quite so."

"If he's lying at all, he might just as well lie his head off," I said. "He may never have been to the city at all. He might have been lying low about the village and come up to the house across lots at any time of the night. Don't you see he could?"

"Of course," said Sage. "Of course."

"Well, then, that's how *far he's* in," said I, and I leaned back to get my breath and mop my brow.

"He had all the opportunity in the world," said Sage. "He certainly had. Well, let's pass up Harry for a minute. We will pass the lovers, Miss Squire, and Mr. Wheeler, for the moment also. How about the stenographer, Miss Milroy?"

"Shucks!" said I. "Her case is as plain as daylight. She came up to the house to take some letters from Mr Sherill. She stayed there till nine o'clock or so. Then she was drove home. It's as natural as anything can be. Sherill hadn't been to the city that day, and he couldn't let one whole day go by without transacting some business. No, there's nothing on Miss Milroy."

"You are positive that Mr. Sherill dictated letters to Miss Milroy?" said Sage, suddenly shoving his thin face from behind the cloud of smoke.

"Ab-s-o-lutely," said I. "She had her note-book and pencil in her hand when she come out of the room."

"You examined the note-book?"

"Who? Me?" said I. "Shucks, what could I make out of them pot-hooks?"

"That note-book may be a very important and interesting exhibit in this case," said Sage, getting up. "We'll just take a run down and have a look at it and a talk with Miss Milroy."

He went to the door and opened it and yelled for Harry. Harry come a running. Sage told him what was wanted. Harry said he would get the car out right away. We saw him and Wheeler pass the window in a few minutes on their way to the garage.

I can't say as I liked the way Sage was looking and acting now. What I had said seemed to have given him something to think about. Maybe I had made out a stronger case against Harry than I thought. Doggone it, I see then that, in trying to make a grand-stand play in front of this *Sherlock Holmes* I had actually been arguing against Harry. I didn't want to do that. I didn't any more think him guilty than I thought myself.

And still I had painted his few innocent moves as black as my kitchen stove. Why hadn't I kept my face shut? Sage was here working on his own hook. Let him find out what he could. That should have been my play.

He probably wouldn't want to see me again anyhow. He had pumped me dry and now he would toss me away.

Well, I made up my mind to kind of take back what I had hinted about Harry, and I just said to myself that I wouldn't let no professional interest carry me away any more.

"Mr. Sage," said I, "I don't want you to get any notion that I think Harry was mixed up in this thing. I was just relating a few happenings that seemed sort of—of odd. I don't think by a long shot that Harry's guilty."

"Oh, that's all right," said Arnold Sage. "I just wanted to hear you out. I couldn't tell what you might have stumbled on. Of course you don't think Harry's guilty. Neither do I."

"Well, you are a wise guy after all, ain't you?" I said to myself.

CHAPTER V.

TANGLED HEARTS.

HARRY came around with the car just then, and Sage and I went out and got into it. Harry and Wheeler were on the front seat. Harry whirled out of the yard and we went down the hill lickety split.

When we drew up in front of Miss Milroy's boarding-house, Harry honked his horn four times one after the other.

"Got a signal code, have you?" Sage said with a laugh.

Harry flushed up and gave him a quick look. I had a notion that by now Harry was kind of sorry he hadn't left the management of the case to me. Seemed like Sage might butt in where Harry didn't want him.

We went up the steps and Harry rang the bell. Mrs. Myers opened the door. She said Miss Milroy was in the parlor. So in we went, single file. Harry and Wheeler were first, then Sage, and then me.

As soon as Wheeler got into the room I heard him say, "Hello," in a pleased kind of voice. And Helen Squire's voice come back:

"Hello, Irvin."

I couldn't figure out what Helen was doing there. I didn't know that she knew Miss Milroy, even. When Sage and I got into the room, Miss Milroy stood opposite us, with the table between us and her.

"Miss Milroy," said Harry, "this is Mr. Arnold Sage, a detective whom I have engaged to work on the—the mystery of my father's death."

Harry kind of choked up on that and Miss Milroy shot him a glance that put me wise to something. Whatever Harry felt about her, she was in love with him. It was the plainest "you-poor-dear" look that I'd seen a woman hand out in some time.

"And so," said Harry, "he wishes to talk to you. He wishes to ask you about your visit to my father that night."

Miss Milroy turned her big, nice eyes on Sage. Sage looked right back at her, and I couldn't tell from his manner whether he had any suspicion of her or not.

"I merely wished to know the circumstances which led to your going to see Mr. Sherill that night, Miss Milroy," said Sage.

"Why, he telephoned to me to come," said Miss Milroy, kind of astonished.

"Yes; and when you got there what did he do?"

"We talked about several matters."

"Business matters?"

"Well, they were by way of being business matters."

Sage didn't say nothing more for a minute. He just stood looking at the girl, very steady. He never batted an eyelash. But he didn't feeze Miss Milroy none. She just looked back at him.

"Can you tell me what the conversation was about?"

"I could tell you," said she, "but I don't wish to."

"Ah," said Sage. "Well, Miss Milroy, may I see your stenographic note-book?"

"Certainly," said Miss Milroy, and she went and got it from her room upstairs.

Sage flipped over the leaves till he come to the last page that had any writing on it. By golly, he was smart. I had to give him credit for that. He went right through them pot-hooks as if they was regular writing.

"This last letter, Miss Milroy," he said then. "Mr. Sherill dictated it to you that night?"

He finished the question without looking up. Miss Milroy didn't say nothing

for a minute. I had a notion to tell her to watch where she was going, for there was something in the way Sage acted that showed me plain enough that he had set a trap for the girl. But at last she come out:

"Oh, no; that letter was dictated several days before that."

"Ah," said Sage again, and he closed the book. "Then Mr. Sherill didn't dictate anything to you that night?"

"No, he didn't dictate anything."

"But you went there with your note-book."

"Mr. Sherill had a habit of dictating letters at any time and any place," said Miss Milroy. "I always had my note-book with me."

Sage seemed kind of disappointed at that, and I can say he went down in my estimation several notches. Miss Milroy's explanation was so simple that it looked foolish for him to have made so much of her having her note-book with her.

"And you still refuse to tell me what Mr. Sherill talked to you about?"

"If you must put it that way—I refuse."

Here Harry broke in. I could see he had been getting nervous. He had kept stepping from one foot to the other

"Mr. Sage," said he, "what my father said to Miss Milroy that night could have no possible bearing on the case. She has told me what he said."

"Oh, very well," said Sage, and you'd have thought then that he didn't give a hooraw what Sherill had said.

It seemed to me that for a world-beater in the detective line he flopped about a good deal. One minute you'd think he was going to tell us who killed Sherill, and the next minute he was looking out the window, so to say.

For a minute now, Sage stood silent, his hands in front of him, patting his finger-tips together. He looked then like there was nothing in the world that could have puzzled him.

"Miss Milroy," he shot out all of a sudden, "whom did you see after leaving the Sherill home — besides the chauffeur?"

"You mean before I reached home—here? I didn't see any one."

"I mean before you reached home or afterwards—any time that night."

Miss Milroy blushed and her eyes turned quick to Harry. I guess she didn't mean to look at him, but it seemed like she couldn't help it.

Harry took a quick step toward her and then he stopped. After a second he turned around to face Sage.

"Miss Milroy saw me that night," he said. "I have said that when I left the car I intended to go to the telegraph-office to send a message. That was not my intention. I came down this road to see Miss Milroy—and I saw her."

"Did Mrs. Myers announce you?"

"She didn't need to," Harry answered. "Miss Milroy was standing by the gate outside."

"She was expecting you?"

"Yes. I had telephoned her from the city. I told her just when I would be here."

"And why did you wish to see her?"

"Well, it was a personal matter," said Harry.

I looked for Sage to fly off the handle at that. It was queer for Harry to be hiring him and then sewing him up on everything he wanted to know. But Sage didn't seem to do anything you might expect him to do. He kind of pursed up his lips and looked over Harry's head.

"That, I think, will be all for the present. We may as well go."

We all went outside, leaving the two girls there. Harry and Wheeler climbed into the front of the machine and me in the back. Sage stood a second with his hand on the open door.

"Pardon me just a moment," he said. "I should like to see Miss Squire again."

Harry whirled around in his seat. He was mad

"What's that for, Sage?" he said.

"What is there you want to ask Miss Squire that you couldn't have asked while we were in there?"

"It's something that just occurred to me," said Sage, and he smiled.

"Good Lord!" said Harry. "I should think you might ask what you have to ask while I'm there."

Sage's shoulders come up a little, and he quit smiling.

"Oh," said Harry, "what's the use of pulling this mystery stuff? Why shouldn't I know-whatever you know?"

"I shall be very glad to have you turn this case over to some one else if you prefer," said Sage, and then the iron in him showed.

I knew he would hot-foot it straight to the station if Harry said another word. And I didn't want to see Sage go. The man had brains, and I was certain I'd never get anywhere on the case by myself.

"Tut, tut, son," said I. "Leave Mr. Sage be. If he wants a private conference with Miss Squire, what's the odds?"

"Is it Miss Squire or Miss Milroy you wish to speak to?" said Harry.

To me there wasn't nothing to the question. It seemed perfectly natural. But I see Sage shove back something that was trying to leap into his face. He seemed to have to smile again in spite of himself.

"Why, if I wished to speak to Miss Milroy I'd say so," he said.

Then he planked his keen eyes on Irvin. He seemed to be moving fast now.

"Mr. Wheeler," he said, "may I ask you a personal question?"

"Of course," said Wheeler, very hearty.

"Are you engaged to Miss Squire?"

Wheeler come up with a jerk. A regular flood of red poured into his face. He was the maddest man I'd seen for some time.

"If I had that honor," he busted out, "it would hardly be my place to make the first announcement, would it? Don't be an ass, Sage."

I looked for the blow-up then. But again Sage fooled me. He laughed that dry-leaf laugh of his.

"No offense," he said. "I merely wished to know."

"Is that why you want to see her—to ask her that question?" Wheeler asked.

"Possibly," said Sage.

"Well, you won't see her," said Wheeler. "Don't you dare make a move toward that door."

Sage turned around without showing no particular haste. He walked straight toward the door. Wheeler sat looking at him with his mouth open. Sage turned with his hand on the doorbell.

"Shall I ring?" he asked.

"For Heaven's sake, Irvin, let him ring," Harry said low.

Wheeler turned in his seat and looked across the road. Sage rang the bell. Mrs. Myers opened the door. Sage said something to her and stepped inside.

He was gone for not more than a minute. When he come out, he was oozing oil. I don't know as I ever see a man so satisfied with himself.

He got into the machine without saying nothing and sank back against the seat.

"What's up?" Harry asked. "Surely you didn't learn anything from Miss Squire. But you look as if you had ended your job."

"My dear Sherill," said Sage, "I have just begun it. Will you take us to Mr. Hill's home, please? I'd like to have a talk with him."

Harry turned the car around and went back to my house.

"When shall I see you again?" he asked Sage.

"This evening," said Sage.

Harry give him a long look and started the car. We went into my house.

"Say, Sage," said I before we set down, "you got me up against a wall. You said this morning you didn't suspect Harry. If you do suspect him, say so now. But I'm telling you that *if* you do, I'm off you."

"I do not suspect him," said Sage, and

I felt he was telling me straight. "Now, I'll tell you what I want you to do. I want you to keep your eye on that servant Martin. Get into his good graces. Pump him if you can. Make him twist and turn on that story he told us about what he did that night. That's a job you can handle."

"Well," said I, relieved to think he had shifted away from any one Harry was interested in in particular, "that sounds more reasonable. But why did Martin want to kill the man who was giving him a good job for life?"

"Martin didn't kill Mr. Sherill," said Sage.

"I'm a patient man, but I'm no Job," said I. "Who in thunder *did* kill him?"

Sage only lifted up his shoulders and cackled that dry laugh of his. I set my teeth into a quarter of a plug of chewing.

"Maybe nobody killed him," said I. "Maybe he killed himself."

"Maybe he did," Sage said.

"Yes, he did," I said, "in a pig's eye"; and I said it so emphatic Sage almost laughed human.

CHAPTER VI.

CAMPING ON MARTIN'S TRAIL.

I WENT up to Harry's that night and began to camp on Martin's trail. Sage went out after dinner and didn't come back. I didn't know where he was. Neither did Harry nor Wheeler. Harry seemed worried. He tramped all over the big house.

"What's your idea in spying on Martin?" he asked me.

"I ain't spying," said I. "What do you think I am? I'm just looking him over."

"You're getting as mysterious as Sage," he said, and went away.

About eight o'clock Harry and Wheeler got into a game of billiards. I went up to Martin's room and knocked on the door. He opened it and I went in.

"Set down," he said.

I sat down and fixed my eyes on him. He looked back at me without seeming to be uncomfortable.

"Well," he said, "what's the idea?"

"Well," I said, "this is where you was the night Mr. Sherill died, wasn't it?"

"It was, sir," he said.

"You can cut out the 'sir' stuff," said I. "Save that for your betters."

A smile actually cracked his face.

"Have a smoke?" he asked, and he held out a good cigar to me.

We settled and puffed for a while. He talked baseball and I found he was a fan.

"Why," said I, "you're almost a human being!"

"Certainly I am," he said.

"What you interested in besides baseball?" said I.

"Nothing much," he said. "I used to like boxing—used to box a little myself—but I'm getting old."

Well, I stared at him. I'd always looked on them valets as being kind of automatic. And here he was chewing the rag like any other regular man.

"Ever do any shooting?" I asked.

"That's a funny thing," he said, knocking the long ashes off his cigar. "I've always had a holy horror of a gun. I don't know why. I ain't never been afraid of anything that interests most men. But a shooting-iron I can't stand."

"Is that so?" I said to myself. "That's mighty interesting to me, old sport. It's the first thing you've said that didn't sound right."

I pulled out a gun and held it in my hand. Martin threw an arm up in front of his face. The move looked like the real thing, too, but I had found out that Martin was a cleverer man than I had given him credit for being.

"Take a look at it," I said, holding the butt of it out to him.

He took hold of it between his thumb and finger. I let go suddenly and the gun swung down. Martin grabbed it with his other hand and held it pointed away from him.

"What do you want me to do with it?" he asked.

"Point it as if you was going to shoot somebody," said I.

He pointed toward the wall. Either he was a good actor or else he was afraid of a gun. He was as awkward as a girl.

"Just hold it a minute longer," I said. "I'll be right back."

I went out into the hall. The thick rug drowned my footsteps, so Martin couldn't tell if I was going or coming. I stood a second at the side of the door and then I shoved out my head and looked into the room. Just as I looked Martin put down the gun, still pointed away from him, and moved his chair away from the table. I drew my head back and in a minute I came back into the room. Martin looked up quick.

"What's the idea?" he asked. "Do you think I killed Sherill? Did Sage set you on me?"

"Oh, we're watching everybody," I said. "We ain't making any special effort about you."

"Well, if you can believe a man would quarrel with his bread and butter at my age, you can believe I done it," he said. "One thing more: If I had done it, I'd say so. I ain't no coward."

"If you'd been coward enough to do it, you'd be coward enough to deny it," said I.

"Mebbe that's so," said Martin.

Harry rang for him in a few minutes and he went out. While he was gone, I searched through his dresser drawers and his clothes, but I didn't find anything except a couple of old score-cards.

Martin come back in a few minutes.

"Mr. Arnold Sage is down-stairs and wishes to see you," he said.

I went down to the old man's library. Sage was sitting by the window, smoking a cigarette and looked very well pleased with himself.

"Well," he said, "what did you find out?"

"Nothing," I said. "What did you find out yourself?"

"Nothing—much," said he. "Tell me just what you've been doing."

I told him about showing the gun to Martin and Martin being afraid of it. Sage's eyes brightened up at that.

"Is that *so?*" he asked. "*Is* that so?"

"So—so," said I. "Both of them."

He jumped up and begun walking around the room. Once in a while he would stop and rub his chin.

"What do you think of that?" he said at last, out loud.

"I don't think nothing of it," said I. "Lots of good men is afraid of guns."

He walked some more.

"It might be so," he said again, in that same way. "It might possibly be so. It's a different idea. It's logical. It must be followed. But *she* couldn't be hired. If it's that way, she's out of it."

"Who's she?" said I.

He said some words that I'd never heard before.

"What's that?" said I. "It sound like Chinese."

"It's French," said he. "It means, 'Find the woman.'"

"Oh, sure," said I, "if you knew who she was."

He gave me a boring look and said nothing.

"Gosh!" I said. "You don't suspect *me*, do you?"

He only cackled.

"Well," he said at last, "I'm going to retire. Can you stay awake to-night?"

"I can," said I, "but I like my rest."

"Well, you can pass it up this once, can't you?" he came back.

"Sure," I told him. "What do you want me to do?"

"Keep your eye on Martin," said he, and out he went.

"Find the woman," and "Keep your eye on Martin." That was where Sage seemed to have got to in his investigation, and if you had asked me just then I'd have said he had a considerable distance to go. I was beginning to feel sleepy already, and I did have a nod or two as I smoked a fresh cigar. Then

gradually the house become all still, though there hadn't been any racket to speak of before.

I went out of the library, clicking off the light as I done it. I had become pretty familiar with the house by now and I got up-stairs to Martin's room without turning on no more lights. Martin's room was dark.

I found a chair in the hall and dragged it under the stairway that went up to the third floor. I sat down and begun to wait.

That was as hard a job as I ever tackled. I didn't dare to take even forty winks, because I've been told that when I sleep I snore like sixty. If I fell asleep I might just as well have tooted a fog horn outside Martin's door.

So I bobbed my head and worked my arms and rubbed my eyes for upwards of an hour, I guess, though it seemed a week to me. I'd never been so sleepy in my life.

Then all of a sudden, when I thought I must doze off, I heard a tiny whisper of a sound near me. I come up with a jerk, wide awake. Then there was a shadow in the dark if you know what I mean. It was just as if the dark could be stirred by a breath of wind. And then the shadow was a little clearer, and I made out Martin going by me. He got to the head of the stairs, moving only by inches, it seemed to me. There was a window at the head of the stairs and in the light from that I could make him out quite plain. He might have wore hobnails over that rug, but he was carrying his shoes in his hand.

Well, I had to give Sage credit for putting me on Martin's trail. Martin seemed to be up to something.

I waited till he was at the bottom of the stairs, as I judged, and then I got up and tiptoed down after him. As I got to the bottom I heard the front door click shut. I ambled to it and opened it.

Outside I could see Martin beating it down to the roadway. I stood on the porch for a few minutes to give him time to put on his shoes, which he done down the road a piece.

He was a quarter of a mile away and going fast when I got to the road. I wished then for the first time in my life that I carried a little less excess baggage in the way of weight. I'm an elephant on the trail. But there was nothing for it, so I started down the hill after Martin.

We come to where the sidewalk started after a bit, and that made it easier for me. The big trees made it pitch dark there, and Martin couldn't have seen me if he had looked back. Pretty soon he came to the station road and turned down that.

"Huh!" said I. "Is he going to make his getaway? Have I scared him out?"

Then I knew that couldn't be it, for there was no train till morning that stopped, even on flag, at our station. I kept on the grass now, and I could hear Martin's feet ringing on the sidewalk.

But pretty soon that sound stopped. Martin was standing still somewhere along there in the shadows. I hustled across the road and snuck under the big trees and went dodging from one to another of them till I thought I had come to about where Martin had stopped. I stopped, too.

Then all of a sudden I took a sharp breath.

I was standing across the street from the house where Miss Milroy boarded!

Had Martin gone in there?

I didn't know what to do exactly. Of course, a high-class sleuth would have dodged over there and got hep to what was going on, but when the most of your detective work consists of giving lodging to bums, you're lost when it comes to the fine points. Besides no amount of practise would ever have made me strong on the tiptoe stuff.

So I just stood there. I couldn't see nothing, for there was a great big tree right in front of the house, and it made everything pitch dark. I wished Arnold Sage had been on the job.

While I was wishing like this, there

come a sound from across the street. It was a footstep on the stone walk.

Then I knew that Martin was beating it back the way he had come. I was sore at myself because Sage would want me to tell him whether Martin had gone in the house or not, and, of course, I couldn't do it.

Well, I pegged along after Martin, keeping on the grass, and by the time he got to the end of the street I was not far behind him.

Martin kept right on, though I was puffing and sweating a little. I had never had such a strenuous night as that before.

Just as I turned the corner, keeping Martin in sight now, I heard my name spoke. I stopped and looked around. Arnold Sage stepped out from behind me.

"What's your hurry?" he asked.

"Good gosh, Sage!" said I. "Martin's beating it up the street. Get after him. You can get within an inch of him and he'll never know it. He's been down to the house where Miss Milroy boards."

Sage pulled out a cigarette case, picked out a cigarette, and lit it.

"Oh, it's all right," he said. "I was down there all the time. Let him go."

CHAPTER VII.

BLIND PATHS.

"WHAT did Martin go down there for?" I asked Sage, as we started toward Harry's house.

"To talk to Miss Milroy," he answered.

"Well, what did he say to her, is what I mean," said I, getting kind of warm.

"What would you think he said to her?" Sage asked.

I stopped and Sage stopped, too. I was getting sick of his wise-guy stuff. I am a police officer myself, which is more than he really is; and the bank in the village will tell you whether I pay my debts. What more did he want?

"See here," said I, "if you want me to assist you on this case, you can open up a little. I'm not going to work in the dark no longer."

"My dear Tom Hill," said he, "I'm not asking you to work in the dark. You are perfectly at liberty to get out in the spotlight, so far as I am concerned. You have been on this case longer than I have."

"Yes, and I been doing just what you told me to do," said I. "If you want me to play a lone hand, just say so and I will. I don't see as you've got so far anyhow."

"Well, I'll tell you," said he, and I saw my bluff had worked.

He tossed his cigarette away, and he added:

"I don't want you gumming things up now. Martin is in love with this girl, and he's trying to save her."

"Aw, what're you talking about?" said I. "That valet in love with Miss Milroy? Why, you're crazy! And now you think she killed Sherill."

"I don't think anything," said Sage. "I only know the facts. She was waiting for him at the gate, the way she waited for Harry that night. He grabbed her hands when he got there and begun to murmur over them like the sloppy fool he it. She was strong on the 'there-there' stuff.

"Am I talking so you can get me? He told her I suspected she had killed Sherill. She didn't say anything. Any woman, in her station—"

"In her station?" said I. "Why, she's one of the nicest, cleanest girls ever hit this village."

"But she's only a working-girl—" said Sage.

"Rats!" said I. "What're you talking about? Only a working-girl? Are you one of these here toadying guys that look down on working-girls?"

"I look down on nobody," Sage said. "Don't misunderstand me. I only look at the game as it's played. A working-girl may prove more important to me, in a given case, than an heiress to forty millions. I merely call your attention to

the fact that Miss Milroy is a working-girl, for the simple reason that that is the key to the situation.

"She's a girl who has been used, more or less, to the seamy side of life. To wit: the boarding-house where she is now staying. She's seen the other side through working for Sherill.

"Of course, we all believe in virtue and goodness and all that sort of thing. But we also know something of womankind. A woman will get hungry for luxuries, just as much as she will for food. Don't you think that the idea of Miss Milroy's becoming Mrs. Harry Sherill would appeal to her?"

"You're unwinding this reel a little fast for me," said I. "It's all a blur. What chance would she have to marry Harry?"

"Why, she's a good looker and clever," said Sage.

"But the boy's as good as engaged to Miss Squire," said I. "His father, as I've told you, wanted them two to marry."

"Which was a perfectly good reason why Harry wouldn't marry Miss Squire," said Sage.

"Now," said I, "I'll just hang to the tail of that remark while you drive it into a corner. Then maybe I can find out what kind of an animal it is. Why was which a perfectly good reason?"

"You yourself have said that Harry and his father never got along together till recently," Sage rattled on. "Well, see how this sounds on your harp: Harry comes home. His father at last tells him that he wants Harry to marry Miss Squire. Harry has two ways to jump. He can oppose his father openly or he can pretend to agree. He chooses the latter way because the old man isn't in very good health.

"All this time Harry is wooing Miss Milroy. Irvin Wheeler has met Miss Squire in the city, and they have fallen in love with each other. Irvin begins to visit the village so that he can see Miss Squire. Everything is going smoothly.

"Some day the two boys are going to marry the two girls. But Harry isn't going to marry Miss Squire. He is going to marry Miss Milroy."

"You dug this out of Miss Squire, did you?" I asked. "You wanted to talk to her so's you could pump her?"

"That's about it," said Sage. "I'd pump her as quickly as any one else."

"Well," said I, thinking I was about to shoot a hot one across the plate, "if everything was going as merry as an oyster stew, why should Miss Milroy want to kill Sherill?"

"The little rift within the loot," said Sage, as I recall it.

"Why, there ain't been nothing swiped," said I.

"Did you ever see a play called 'Kumeel'?" Sage asked.

"I never been out of this village more'n three weeks all together in my life," said I. "When I went away in the daytime I generally managed to get back by night. No, I never seen that show."

"Well," said Sage, "let's imagine that Sherill discovered what Harry, Wheeler, and the two girls was attempting to put over. He didn't send for Harry. He was too keen for that. He sent for that girl—Miss Milroy. He sent for her when he knew Harry wouldn't be on hand to butt in.

"Sherill was an aristocrat by nature. He didn't beat about the bush with a girl who was working for him. He asked her how much she wanted to blow and leave Harry alone.

"Miss Milroy is no fool, and she's proud. More, she's good as girls go. She didn't want to be paid for quitting Harry. She wanted to come at the Sherill fortune by way of the altar. She told Sherill where he got off.

"I don't say she deliberately killed him. It was Sherill's own gun that did the business. I don't know how that gun got into action. Somehow Miss Milroy got hold of it and it was exploded and the bullet killed Sherill.

"They were two high-strung people, discussing a situation that is as old as

the hills. It's a situation that has caused more than one tragedy. And there you have it."

"And there I haven't got it," said I. "I've known more girls like Miss Milroy than you have, I guess. I'm telling you that if Sherill sent for her and pointed out to her that it was for Harry's good that she quit him, she'd quit."

"That's a kind of a 'Kumeel,'" said Sage.

"I don't know about that," said I. "But I'm placing a bet on Miss Milroy."

"Oh, well, that's all right," Sage said. "I'm going up to talk to Harry, now. If you're through with the case, I suppose you won't want to go."

"I ain't through," said I. "I'm just beginning."

As we started along, I saw that Sage was looking at me hard. I didn't look at him full. I was only hanging a bluff, but I didn't want him to know it.

That trick of his of building up a case had me going. He didn't base his calculations on the people he had to deal with at all. They all looked alike to him.

I'm just the other way. I ain't lived as long as I have without knowing that some kinds of people will commit a crime and some kinds won't. Some people are good and some are bad. That's all there is to that.

Why, I've put in our lockup men that was as kind-hearted as any man that ever lived. Some of them down-and-outers can tell you stories of hard luck that show you what they would have been if they'd had a chance. I may not be much of a sleuth, but you can't fool me much on people.

"Well," said Sage as we went along, "what I've told you is in confidence."

"Oh, sure," I said. "I ain't going to say anything. But I'll say to you that you're headed straight up a blind alley."

Sage said nothing. When we got to the house, Martin let us in. Sage sent for Harry. Harry and Wheeler come right down to the library. Harry was looking pale and worried.

"Buck up, lad," said I. "The worst is yet to come."

Harry had closed the library door behind him. We all sat down except Sage. He turned and looked quick at the door. Then he stepped to the far side of the room.

"Engage in a little idle conversation, gentlemen, if you will," he said in a whisper.

Harry looked at him kind of disgusted, but he begun to talk baseball to Wheeler.

"A little louder," said Sage.

They lifted up their voices. Sage edged along the wall till he come to the closed door. Then he suddenly grabbed the knob and threw the door open.

And outside of it was Martin on his knees. He had had his ear to the keyhole. At sight of him Harry jumped to his feet.

"Martin, you poor fool, what do you mean?" he asked.

Martin looked funny, kneeling there, his face turned up to Sage. He was as active as a dead turtle for about a minute. And then all of a sudden there was a look of fury come over his face.

Fury! Gosh, it was worse than that! I don't know what else to call it, though. He was worse than the wild man of Borneo.

He got up slowly to his feet and come into the room. He had his head stuck forward, and I could see the veins swelling in it. His hands was clenched at his sides.

Even Sage backed away from him a step. But Harry was across the room in two jumps. He grabbed Martin by both arms and shook him till Martin's head bobbed back and forth. Then he shoved him away.

"What do you mean by eavesdropping in this manner?" Harry yelled.

Then the fury died out of Martin's face as fast as it had come. He blinked his eyes and seemed to kind of shrink together.

"I beg your pardon, sir," he said.

"Why did you do it?" Harry asked.

"Well, sir," said Martin, "there's so many people around here, nosing into things. I just wanted to know what was going on. I got some rights in this case. I was practically alone in the house the night that Mr. Sherill was killed. This policeman has been watching me. I didn't know—"

"Why, nobody suspects you, Martin," Harry said. "You had no motive for killing my father. Now, go back to your room and stay there unless I ring for you."

Martin took a step backward and then stopped. He stood looking at Sage, but Sage didn't pay no attention to him.

"Does this man think I had any hand in it?" Martin asked.

Sage raised his head then. He didn't show no feeling toward Martin. He was all mildness.

"You didn't kill Mr. Sherill, Martin," Sage said. "You needn't worry about it."

What I'd call a kind of hungry look come into Martin's eyes. His lips twitched and he licked at them.

"Who did it, then?" he asked.

"That is what we are trying to discover," said Sage, and he give his dry laugh. "You may go now. Mr. Sherill has dismissed you."

Martin looked like he wanted to stay—like he had some more questions on his tongue. But finally he backed out of the room, his eyes still on Sage's face.

Sage turned around on Harry then, all business.

"Mr. Sherill," he said, "the time has come when we must be perfectly frank with each other. I feel that I am approaching a climax in this case. There are some questions I should like to ask you. They may prove disagreeable."

Harry shifted in his chair. I didn't like the movement. It wasn't like Harry. It made me feel that Sage had something on him, too.

"Fire away," said he, however.

"You are aware, of course, that your father wished you to marry Miss Helen Squire?" said Sage.

Harry sat looking at him like an open blank book. Sage give him a kind of an impatient look.

"To marry Miss Squire," said Harry at last. "Why, my father wished me to marry Miss Milroy. He brought me home especially to meet her. We had had no conversation in which Miss Squire was mentioned for—well, for a very long time."

CHAPTER VIII.

REVELATIONS.

I EXPECTED that would rather take Sage off his feet, but he only smiled a bit.

"You might tell us about that if you cared to," he said, as if it didn't make a whole lot of difference.

Harry heaved a sigh and squirmed in his chair a little. Then all of a sudden he become still and leaned toward Sage.

"I have learned the meaning of life somewhat since my father died," he said, speaking soft and low. "I can see now that I wasn't much of a son to him. I had a reputation among my friends of being a 'kidder.' I was rather proud of that. I can see now that I was only a fresh guy. There was my proud, ambitious father looking to me, his only son, to succeed him in his business, to carry on his name—and all that sort of thing. And I was only a thorn in his flesh.

"When I was a kid, he stood for it, but as I grew older we had a good many scenes. He would have done right if he had dumped me out in the street and left me to shift for myself, but he stuck right along with me. But I thought he was only complaining when he tried to straighten me out.

"You speak of Miss Squire. Why, I have known her all my life, but my father never mentioned her in my presence—never even hinted that he wanted me to marry her.

"However, he did speak of marriage a short time before he died. I was in the

city, and he asked me to come out here for a while. I came home with him one night. Miss Milroy was not in the car that night for some reason or other. I suppose my father prearranged that.

"That evening father and I were in the library here, smoking. Martin came to the door and announced Miss Milroy. Father had her come in. I got up to go, but Miss Milroy was in the room before I reached the door. Father introduced us.

"Well—I fell in love with Miss Milroy on the spot. Since, I have learned that she fell in love with me. I proposed to her the day before my father was—murdered. I was going to tell him that Sunday after I came home from the city that Saturday night.

"The night Miss Milroy came here and I met her, I stayed in the room with her and father while he dictated a couple of letters. Why, I can see now that he brought her here to introduce her to me. The letters didn't amount to anything. They could have been handled at the office next day just as well as not.

"After Miss Milroy had been sent home, father turned to me and looked at me rather queerly.

"'How do you like her?' he asked.

"'Miss Milroy?' I asked.

"He nodded."

Harry stopped and give a kind of a moan.

"I wish now that I had been frank with my father on that occasion," he went on. "But, you see, we had never got each other exactly figured out, and I didn't know quite how he would feel to think his only son had become interested in his stenographer.

"'Why,' I said, 'she seems to be a nice, pretty girl.'

"'She is,' dad said. 'Harry, she would make a good wife for any man. She would make a good wife for you. I'd suggest that you see more of her.'

"Well, in a strained sort of way I had come to know my father pretty well. I could see now that he was expecting antagonism from me. But I wasn't antagonistic to that idea.

"'All right, father,' I said. 'I will.'

"We talked for a long time about many things that night, and we really got closer to each other than we had ever been. I realize now that father was studying me all the time. I remember the queer look in his eyes. At the end he seemed rather dazed, but I put that up to the fact that for once I had not been stubborn with him.

"Well, the upshot of all that was that Miss Milroy became engaged to me. As for Miss Squire—why—well, Wheeler can tell you about that."

"I have the honor to be engaged to Miss Squire," said Wheeler.

"Harry," said Sage, as if he hadn't been listening very closely to this talk, "have you any idea who killed your father?"

"What!" Harry yelled. "If I had, do you think I'd be sitting here?"

Sage got up.

"I guess that's all," he said.

Harry jumped up, too.

"Sage," he said, "have you any idea who killed my father?"

"I never make any disclosures that I can't back up by absolute proof," said Sage, and his voice was hard. "As soon as I have my case complete, I will let you know. Mr. Hill, I'd like to talk to you a bit."

I followed him out into the hall.

"The same job for you to-night," said he. "Watch Martin."

"What 're you going to do?" I asked.

"I don't know yet. It depends on what turns up."

"You still got the notion that Miss Milroy is guilty," said I.

"What Harry has said makes no difference," said he. "For all I know, he may be infatuated with Miss Milroy. But while his father lived, there was no chance of his marrying her. I think he's lying about his father."

With that he beat it down the hall and went up-stairs. I lit a cigar and went

outdoors. There was several things I wanted to think about. I wished for a minute I had Sage's brains. For I had several hunches that I wanted to turn inside out.

But it was no good mentioning them to Sage. He wouldn't take a hunch from nobody. He had built his little house, and there he sat in it.

So out under the stars I begun to build a little house of my own. But I didn't get very far. And then, all of a sudden, I got an idea right out of the clear blue sky. It was this: In suggesting Miss Milroy to Harry, Sherill had been playing on the boy's stubbornness. There it was!

Harry had never done anything the old man had wanted him to do. The old man had figured he wouldn't take up with Miss Milroy. But Old Dame Nature had stepped in and done the business for Harry. I knew he was in love with the girl, because he was not one to pretend about that to anybody.

And then I got a shock as I had put my hand on a live wire in the dark. Had Sherill found out the state of Harry's feelings and called the girl that night to tell her she must break off with Harry? Gosh, there was a motive stronger than Sage's!

There would be the girl, feeling she was welcome to the old man because Harry had told her what the old man had said. And there was the old man, mad clear through because Harry had followed his lead too much by the letter. I knew the temper he had. If the girl had explained the situation to him, he would lose his temper and tell her she was a fool to think she could marry his son.

And she was a proud girl. She would give him as good as he sent. How the gun got into play I didn't know. But it had got in, and there had been a shooting

By the time I got that far, my shirt was wet with sweat. That was the first time I had really ever tried any high-class detective thinking, and I felt as weak as if I had been in a battle with a lot of bums. But I had got an idea, and I hung on to it like a pup to a root.

I didn't think Miss Milroy had really committed a murder. She might have killed Sherill accidentally, but there's a difference between killing and murder. So I made up my mind I would go to see her. Martin could shift for himself. I wasn't taking orders from Sage, anyhow. I had been on the case before him.

So I hit the highway for the boarding-house again. It was near morning now, and the east was getting gray. It was no time for a call on a young lady, but I had to hit while the iron was hot. I knew if I slept on my hunch I'd wake up to find it cold.

I had to hammer for some time before Mrs. Myers stuck her head out of an upstairs window and called down who was there. I told her it was me, and she said to wait a minute. She was huffy when she finally opened the door, but I explained that it was police business I was on, and she shut up.

I waited for Miss Milroy in the parlor for quite a spell. I was nervous, and the darned sweat kept leaking down into my eyes. I was mopping away for dear life with a red bandanna when Miss Milroy appeared in the doorway. She was dressed in a kind of a wrapper, and her hair hung down her back. She looked like a kid that has just been woke up.

"Shucks!" said I before I thought. "It ain't possible, even as an accident."

She come across the room to me in a kind of a flutter, her eyes wide and her hand at her throat.

"What isn't possible?" she asked.

"That you killed Mr. Sherill."

She stopped and stood, looking at me with them big eyes. I could see that the hand at her throat was kind of shaky.

"Mr. Hill," she said in a low voice, "what do these night visits mean? What do you and that terrible man suspect?"

I had a good notion to beat it away from there. It was a shame to be bothering a nice girl like Miss Milroy at all

hours of the night, breaking up her rest and making her worry. But still I was a sworn public officer, and I was in duty bound to follow my hunch. But it was the hardest job I ever tackled. So I mopped once more, hemmed, and struck out

"Between you and me, Miss Milroy," said I, "Mr. Sage thinks you killed Mr. Sherill. Of course, he don't think you actually murdered him, but he thinks you had some words and got into an argument about Harry."

I expected she would break out with a deny, but she didn't. She only stood there like she was, except that her bosom begun to rise up and fall down pretty fast.

"Are you engaged to Harry?" said I.

Suddenly she dropped her hands to her side. Her face got sort of stern.

"Have you asked Mr. Sherill that?" she asked.

"He says you're engaged," said I, simple.

"Well, we are," said she. "Mr. Sherill wished us to marry."

"Sherill told you that?" I asked.

"No; he told me that night he didn't wish us to marry."

The fog come down thick over my brain then. I thought about little girls that pick flower leaves and say, "He loves me, he loves me not."

"I don't quite get you," said I.

"He told Harry he wished us to marry," said she. "He sent for me that night to tell me it was all a mistake. He said Harry had always been stubborn, and he thought if he urged me on Harry, that Harry would resent it. He was afraid, too, that Harry would become infatuated with me if nothing was said in my favor.

"And he wanted Harry to marry Miss Squire. But Miss Squire loves Mr. Wheeler. And Harry and I love each other."

I saw it then plain enough. The old man had played Harry's stubbornness, just as I had figured, and Harry hadn't been stubborn. He had thought he was pleasing his father at last. It was a swell mix-up.

"And so you and the old man quarreled," said I.

"We didn't quarrel," she said, quick. "Oh, don't you think I have any pride? He said it would be best for Harry if I gave him up. I told Harry that that night, and I intended to go away. And even then Mr. Sherill was lying dead up in that big, lonely house."

She begun to cry, her breast heaving, and the tears running down her cheeks.

"Well," said I, and I had a lump in my own throat, "it's a cinch that you didn't kill Mr. Sherill. That's the main point."

And then I got another shock. Miss Milroy passed her hand over her face, as if she was terrible tired. When she spoke it was in a kind of a husky whisper, as if she had taken cold all of a sudden.

"Well, I don't know," said she. "I was dazed with what Mr. Sherill said to me. I had been fiercely happy since Harry had asked me to marry him. I don't exactly remember getting out of the house. It might be—it is barely possible—that I somehow left a dead body behind me there."

And then she begun to kind of wilt and stagger back against the wall, grabbing at something that wasn't there to support her. I got a hold of her and hollered till Mrs. Myers came running and got her away, and scolded me out of the house.

CHAPTER IX.

HOW SHERILL DIED.

IT was broad daylight when I climbed the hill to Harry's house again. I climbed good and slow, too, I can tell you. I felt like an old man. I ain't used to losing my rest like that, and I was as sorry for Miss Milroy almost as if she had been my own daughter.

I wanted to see Martin first step. I didn't know just exactly what I was going to tell him, but I was going to find out

what he had been pestering the girl about. I had a pretty good notion what it was. The story he had told was, of course, bunk now. Sherill had been killed earlier than Martin had said. He had found Sherill dead as soon as the girl had left the house.

Instead of telling the truth, he had covered up her and himself, and then he set out to blackmail her. The more I thought about that, the madder I got. I'd fix that blackmail game, if it was the last thing I ever done.

There wasn't a sign of life about the house as I walked up the front path. I had a notion to ring the front-door bell. Then I thought I'd take a look in the rear. As I hoped, the cook was in the kitchen, getting things started for breakfast. I opened the kitchen door and walked in.

"Martin still in bed?" I asked.

"Yes, sir," said the cook.

"Stay here in the kitchen and keep your mouth shut," I said, and I went through the house to the stairs.

Outside Martin's room I stood listening a minute. There wasn't no sound in the room. I turned the knob and the door gave. I walked in.

There was Martin sitting by the window with all his clothes on.

"Ain't been to bed, eh?" I said.

"Yes, I been to bed," he said, "but I couldn't sleep."

I guessed he wasn't lying about that anyways. He looked as if he hadn't slept for weeks. His face was chalky, and his eyes had dark rings underneath them. He was an older man than I had thought.

I glanced around the room. On the bed was a traveling-bag, and I see that the things that had been on Martin's bureau was gone.

"Getting ready to take a trip?" I asked with a sneer.

"I suppose I shall be going before long," said he. "Mr. Sherill won't have no use for me. He has his own servants in the city. He'll be bringing them out here, I suppose."

"He given you notice?" I asked.

"Not yet," said he.

"Well," I said, "just open that bag."

He done it without a question or a word of objection. There was nothing in it of interest to me except two photographs. I stood staring at them. One was a young woman, and the other a woman maybe thirty or so. They resembled each other a good deal.

"Who's them?" I asked.

"I guess you can see for yourself, can't you?" Martin asked.

I laid the pictures on the bed, and then I turned to Martin.

"Yes, I can see," I said. "And now you can come through with the straight of this thing. You're trying to blackmail Miss Milroy."

Martin's mouth dropped open; his eyes popped out. Then he snorted.

"Wha-at!" said he.

"Yes!" I said. "That explains your visit to her the other night. You went to her house and palavered over her, and then you sprung a touch on her to keep your mouth shut about what you know."

"What I know about what?" Martin asked.

"About Miss Milroy killing Sherill—accidentally," said I. "I've just had a talk with her, and she has practically confessed."

He acted like I had hit him between the eyes with a hammer. The man was stunned. He lolled back in his chair and his eyes was closed.

"Come out of it," said I. "That bluff won't work with me."

He opened his eyes in a minute, but he still lolled back in the chair, helpless like.

"What did she say to you?" he asked.

I repeated what the girl had told me, word for word, as near as I could remember. When I had finished, Martin was sitting there with tears coming down his cheeks.

"Shucks!" said I. "Quit that. Men don't cry."

"Why—why!" said he; "I told her not to say nothing! I told her you couldn't get nothing on her. Her alibi was complete."

All of a sudden he stiffened and sat up. He was as calm now as he had been knocked out before.

"Well," he said, "I'll tell you about this business."

He stopped for a minute and folded his big hands in his lap. He leaned forward and looked straight into my eyes. There wasn't no sound except for the birds outside and a church bell ringing far off some place for early service. I could feel prickles running up and down my back. Then Martin spoke:

"I killed Mr. Sherill."

"You did?" said I, and for a second a blur came over my eyes.

"I did," said Martin. "I'll tell you the story. Miss Milroy is my daughter. She's all I got in this world—all I ever had except for two years a long, long time ago. Then I had a wife—her mother. And now she's trying to save me because she knows what I been through. Nobody else knows, but she knows.

"Twenty-three years ago I was a young man of the servant class in England. I had a good job. The girl who became my wife was in service with me. We was decent people, never doing any of the things that other servants sometimes did.

"My girl was made up to by the young bloods, but they never got no place with her. She was too clever and clean for 'em. We was married, and in a year our daughter was born. I was so happy I didn't know what to do. I had a good wife and a pretty baby and money in the bank and a good job. It was heavenly, I tell you, Mr. Hill.

"Well, they say Heaven is eternal, but it ain't. The man I worked for had a son. He come home for holidays. It was like a fire in straw between him and my wife. They ran away, leaving me with my baby.

"I was going to kill myself. I would have done it if I hadn't had the baby. So I cut everything in England and come to America. I was mother and father to that baby, and she knows it. That's why she told you what she did.

"I spent all I made on her, more and more as I prospered and she grew older. She's well educated—as well educated as the best of them. I sent her to no end of schools. She learned languages and stenography and typewriting. I didn't know how long I'd be here to look after her, and I wanted her to have something to support herself by.

"Then Mr. Sherill wanted a stenographer when he moved out here. It was to be a kind of private job. I figured it just the thing for my girl. It would be much better than a job in a general office.

"So when I heard Sherill mention it, I said I thought I knew just the woman he wanted. He had me fetch my girl out to see him, and he gave her the place after he had tried her.

"It looked like I was to have a little happiness at last. I had a good job, and my girl was fixed for a long time—as long as Sherill lived. But I didn't figure on young Sherill.

"One night when I went to see my girl on the quiet, long after folks was to bed, she told me she loved Sherill. It was a bitter blow to me. I didn't believe Sherill was honest, but she put up a stiff argument, and made me promise to do nothing that would interfere with her happiness. I promised, but I began to nose around to see what was going on.

"Then come the night when Mr. Sherill sent for my girl. I seen her come into the house and I stopped her. She laughed at me and said Mr. Sherill had some work for her to do. It didn't look good to me. So I opened the door off the library, leading into an adjoining room, and I listened to what went on."

Martin stopped, and his face went hard and bitter.

"I ask you to remember what I had been through before," he went along. "It was about the same situation again, except that the old man was making a fool out of her where the young one had made a fool out of my other girl. And I was listening! I had the edge there.

"Old Sherill didn't have no work for her to do. He jumped right into what

had been on his mind when he sent for her. He asked her was she engaged to his son. She said she was.

"'Really engaged with an intent to marry?' said he.

"I am a man of passionate temper, Mr. Hill. My hands was working at my sides, eager to get at his throat as he put that question to the only human being in the world that I cared about.

"'You're insulting,' said my girl.

"Then Sherill laughed. That was too much for me. I knew I was going to fling myself at him as soon as my girl got out of the house. It seemed like all I had been through had gathered in my brain, and that it must blow up in a second.

"'You can't marry my son,' said Sherill. 'But I'll do the square thing by you. I'm somewhat to blame. Figuring my son would oppose any suggestion from me, I recommended you to him. I thought he would veer off from you and take up with Miss Squire.

"'My son is to marry Miss Squire. That's been arranged for a long time. How much money do you want?'

"My girl turned right around and got out of the room. I let her out of the front door. She was blinded, so that she didn't even seem to see me. When I closed the front door and turned around, Sherill was standing in the library door.

"'Martin,' he said 'come here.'

"He went into the library and I followed him. I changed the lock of the door so that it would be locked from the outside. He heard it click and wheeled around.

"'What's that for?' said he. 'More blackmail?'

"I seen red, as they say. I walked up to him. He was standing by the table. The drawer was partly open.

"'The girl who has just left here,' I said, 'is my daughter.'

"'Oh!' he said. 'She doesn't even use her own name? You two are working together, are you?'

"'Martin's my name,' said I. 'Always has been. She don't use it, because I wanted her never to be associated with what's dead and gone.'

"'You're a pair of criminals,' he said.

"And then he said my daughter was something worse than that.

"I hit him in the face. I am a strong man, and the blow staggered him. He grabbed at the table, and the drawer came fully open. The gun lay right there under his hand. He snatched it out of the drawer

"Before he got it up I was on him. I grabbed his hand and was bending it back when he got it away from me a little. The gun went off somehow and he fell. That's all there is to it."

I got to my feet. I was shaking. I took one step toward Martin, and then the door was opened. In stepped Sage.

"Very well done, Mr. Hill," said Sage. "I thought you'd get something out of Martin if you camped on his trail for a while. I took the liberty of listening, however. Mr. Martin, you are under arrest. Will you go quietly?"

Martin got up kind of weak. He seemed shrunk together. Then he jumped. His right fist caught Sage on the jaw. Down went Sage and lay still.

Martin turned on me. I saw his fist coming toward my own jaw, but I couldn't get out of the way of it. Outside the birds stopped singing for a long time.

CHAPTER X.

WHEN HAPPINESS ARRIVES.

WHEN I come to the cook was kneeling over me, with a bottle of ammonia under my nose. I sat up. My jaw felt as if I had had all my teeth pulled.

"Martin said he was a strong man," said I to the cook. "If he asks for a recommend, I'll give him one. Where's Sage?"

"Down-stairs, telephonin'," said the cook. "He come tottering into the kitchen and told me to come up here and revive you. How you feeling?"

"Oh, I can hear the birds again," said I. "They quit for quite a spell."

I tottered down-stairs, too, and went into the library, where I heard Sage spitting words into the telephone. I sat down and watched him. I was glad of a rest.

Slowly I tumbled to what he was doing. He was calling towns and villages far and wide and throwing out a net to catch Martin. At last he put the receiver on the hook and sat down.

"Why didn't you grab Martin when you saw him assault me?" he said, kind of peevish. "I've known all along that Martin was the person who killed Sherill. I put you on his trail, because I wanted you to have all the credit possible. It was your case."

"Why didn't you catch him yourself?" said I. "You had first chance."

"I wasn't looking for the attack," said he. "The man must be a pugilist."

"I was looking for it when it come my way," said I, rubbing my jaw. "And I found it. Didn't them birds quit singing sudden?"

"Don't be a fool," said Sage, mad. "Go and call Harry."

"Go and call him yourself," said I. "You figured Martin so fine, maybe you know what we're going to do next. I might ball things up."

He didn't go. He put his hand on the button under the library table and held it there till the flustered cook come in.

"Tell Mr. Sherill and Mr. Wheeler to come to the library at once," said Sage.

"Yes, sir," said the scared cook.

He was gone ten minutes. When he come back his face was puzzled.

"Mr. Harry nor Mr. Wheeler ain't in their rooms," said he. "The chauffeur is gone, too, and the big car. I guess they all went in the big car. Martin took the runabout."

"Why the dickens didn't you say that before?" Sage yelled, and he run to the phone again and called all the villages over once more, telling constables and marshals like me to look out for a runabout with Martin in it.

One of them found the runabout in a ditch next day.

"Is there another car on the place?" Sage asked the cook.

"Yes, sir; there is an old five-passenger car in the garage. It will run all right."

"I'm going for a ride," said Sage. "You can come if you want to."

It wasn't what you would call a real pressing invitation, but I took it. I wanted to be in at the finish.

We got the car and rode down to Miss Milroy's boarding-house. Mrs. Myers come to the door. She was grinning like something pleased her. She said Miss Milroy wasn't home.

"Where is she?" Sage asked.

"She's went away," said Mrs. Myers.

"Where has she gone?" said Sage, and he pointed one of his bony fingers at Mrs. Myers.

I expected to see Mrs. Myers lose her nerve, but I forgot she had been keeping boarders for going on to twenty years. She was never bluffed a step.

"She's went away," said Mrs. Myers.

"You tell me where she's gone to or it 'll be worse for you," said Sage.

Mrs. Myers quit grinning. Her thin face was like what I suppose it would be when a man spent his pay for booze and couldn't pay his board.

"The worse for me?" she said. "Who do you think you're talking to, Mr. Detective? You threaten me like that and I'll have the marshal arrest you. You get out of my house."

Sage got out and I followed him. We drove over to Miss Squire's. She wasn't to home neither.

"There's something queer about all this," said Sage. "We'll drive out in the country."

We spent the best part of the day driving over the country roads, but we didn't get no trace of Harry nor Wheeler nor the girls. About four o'clock we struck back into the village.

As we come to the depot road, we saw a big car coming up it. Harry and Wheeler and the two girls was in it,

Harry driving. Harry waved his hand and cut in ahead of us, and beat it up the hill to the house. We followed.

They was all waiting for us in the library. Sage stalked in, his face as black as thunder

"You chose a very poor time to be absent," said he. "We have discovered who killed your father."

Harry went white and his hand grabbed the edge of the table.

"Who was it?" said he.

"It was this young woman's father," said Sage.

"So you found it out, did you?" Harry asked.

Sage took a step toward him.

"You knew all along?" he asked.

"I knew only this morning," said Harry.

He turned to Sage so that he faced him full.

"Mr. Sage, allow me to present my wife," he said; "and Mrs. Wheeler," pointing to the former Miss Squire.

"Wedding bells," said Sage. "I congratulate you. But if you had deferred your marriage we might have caught your father's murderer."

"It wasn't murder exactly," said Harry. "It was more of an accident.'

Sage shrugged his shoulders.

"I have turned the pursuit of Mr. Martin over to the various local authorities," he said. "There is nothing more I care to do, since you show so little interest. My fee is two thousand dollars."

My jaw dropped. Harry sat down and wrote a check. Sage left, to be driven to the station by the chauffeur, who was waiting outside.

Mr. and Mrs. Wheeler followed him out of the room. Harry turned to me. He was a man grown now, this boy who had been so stubborn to his dad. He looked like he would have a good many things to think of for some time to come.

"What do I owe you, sheriff?" he said.

I looked at his wife as she sat kind of drooping by the table.

"You owe me thanks for knowing when to take a knockout," said I. "Anything more than that that's coming to me the township pays."

Harry wrang my hand 'most off.

"Anything I can do for you—any time—let me know," said he.

"You can be a good boy from now on," said I. "Do what your wife tells you to do, and you can't go far wrong."

I started for the door.

"Good by, Mrs. Sherill," said I.

She got up quick and run across the room to me. I turned around again. She put her hands upon my shoulders and looked a long time in my eyes. It would take a more educated man than me to tell you what was in them big eyes. I only know that I had a feeling that Harry would have to be awful good to that little girl. She was sad to her soul.

She slipped down her hands and went back to Harry. He took her in his arms, and was holding her close and patting her hair soft as I closed the door.

I went down the hall. At the end of it I come on Mr. and Mrs. Irvin Wheeler. They was in a clinch, too.

"Lemme out of this," said I; and I don't know as the air of a summer evening ever smelled quite so sweet as the air did that evening.

And the birds was hollering their heads off. As I went along the path a young one, just learning to fly, flopped along ahead of me. I stepped very careful.

P.S.—A year later. Nobody never caught Martin. Nobody knows where he is. I wish I could write him a letter and tell him what I seen this morning. I was driving by the Sherill home 'and Mrs. Sherill was wheeling a baby-buggy across the lawn. She seen me and gave me a high-sign, and clear out to the road I could hear her laugh.

"Shucks!" said I to myself. "In this world, young folks never knows just what minute happiness is going to sneak up behind 'em and give 'em a knockout."

(The End.)

On the Editorial Carpet

Where We Gather in the Hut, Tell Our Troubles, Help One Another, and Sing Some Old Songs.

ONE of the most incredible things in all civilization is the telephone; but for so many years this invention has been performing its miracle of instantaneously carrying the speaker's voice over uncounted miles and delivering it to the listener, down to its every last modulation, inflection, hem and haw, that we long ago ceased to marvel or speculate over this crowning wonder of scientific achievement.

Possibly it is because we have taken the telephone for granted that there have been so few telephone novels written. At any rate, the amount of fiction in which this prodigy of the human intellect has had the premier position, is very small indeed. Next month we practically blaze the trail when we publish, complete in one issue, a telephone novelette—

THE TROUBLE-SHOOTER

BY ETHEL AND JAMES DORRANCE

With the outcome of this story, Dr. Bell's immortal invention has more to do than has even the hero or heroine, though both of the latter are active enough. The *Trouble Shooter* is *Rod McGrath,* who is hired to patrol and keep in repair a dinky little one-line telephone among the mountains of the Union's most northwesterly State. The P. S. and C Railroad is building from the city of Tidewater, on Puget Sound, to the rich mining country of Cascade; but when the story opens twenty miles still intervene from "End of Steel," as the construction camp at railhead is known, and the road's final objective. It is these twenty miles which constitute husky *Rod's* beat.

Nor are wire-trouble, landslides, and all the perils of the bitter Rocky Mountain winter the only obstacles which *Rod* has to overcome. At the same time that he has this strong man's fight to keep his job stopped, he also has to contend against human antagonism of many kinds—villainy from one quarter, jealousy from another, suspicion from a third.

Lots of action. And an ending that satisfies.

REGARDING his article entitled "The Nerves of a Dreadnought," which is to appear in the next issue, Mr. Samuel W. Beach writes:

> It is dedicated to the brass-pounder because of the big fighter's wireless; to the towerman because of the great vessel's thousands of mechanical as well as electrical switches; to the railroad engineer because of the smooth perfection of the mammoth ocean mogul's control; and to all other readers because of the bewitching facts and staggering figures herein disclosed."

I should say so!

Ask a locomotive engineer if he could figure his speed by the number of revolutions of his drive-wheels per minute, making allowance in his head for slippery rails, plus a known percentage of grade, minus a rear-wind pressure

"Impossible!" he'd be very likely to say

Yet the modern superdreadnought has a

mechanism which enables those who control the great vessel to perform exactly such a mathematical contortion.

Many other facts of peculiar appeal to railroaders. Lots of pictures.

ONE of the most interesting pieces of railroad-construction work ever undertaken was the building of the Florida East Coast extension from Jewfish to Key West—a stretch of track which skips spryly from one "key," or low island, to another for over a hundred miles, till finally it reaches its terminus, "America's Gibraltar." The three and four-mile-long isthmuses thrown up between the keys for the support of the tracks, the dangers encountered from storms, wrecks, and Cape Sable mosquitoes, and the big gang of bully good fellows working on the project, are all described in a lively and fascinating manner by Warren Safford, who held down a job there, and knows all about it.

WITH this issue we start a series of five papers, taking up "The Story of the Passenger-Train" from various phases and angles that are little thought of by the casual traveling public. The author is Claude Washington, whom we are glad, indeed, to welcome back among our contributors.

Next month Mr. Washington will tell you "What the Passenger Never Sees" about the train-crew. For instance, when you see the old engineer nonchalantly peering out of the cab-window at the head of the fast express, have you ever stopped to think of the process by which he got there? Mr. Washington will tell you about it; and a searching process it is; for of every hundred firemen not more than seventeen or eighteen become engineers; and of every hundred engineers only six get the coveted passenger-run

Facts equally as startling are also imparted by Mr. Washington in connection with the education of the trainman, the conductor, and the baggageman, all of them members of the crew upon whom the safety and comfort of the passenger vitally depend

Mr. Washington's series on the passenger-train will comprise five papers in all.

FOR a moving picture of big railroading that is full of life and action, you are respectfully referred to that part of the Pennsylvania lines running westward from Altoona, over the hills to Pittsburgh. Sixty-two and one-half miles of freight pass Gallitzin at the rate of one complete train on an average of every nine and one-half minutes for each twenty-four hours. Here an engineer once backed his locomotive into a runaway freight so gently that the draft-gear was not damaged, put the engine into the back motion, and so reduced the runaway's speed that when the train finally collided with the drag ahead, no serious damage was done.

Here also they switch with a wrecking-crane at a pinch—just hoist the car they want out of the middle of a train they can't move, over the backs of intervening cars, and so down on to the proper track.

Charles Frederick Carter will tell you all about these wonderful things—and others even more wonderful in his article next month, which forms the fifth in his series of "Big Railroading." Like its predecessors, this article will be fully illustrated.

AS for the other good things coming to you—the articles, the pictures, the poems, the departments, and especially the short stories—I'll let this issue which you have in your hands speak for the issue to come. If you like this number, you'll like the next; if you don't like this number, please tell us why, and we'll do our humble utmost to see that some succeeding magazine strikes you right where you live.

THE RAILROADER'S MAIL-BAG.

UNDER the title, "They That Desert the Key," the New York *Sun* publishes an editorial, which we are glad to reprint, inasmuch as it discusses a question dear to the heart of every ambitious telegraph operator namely, how to get to be president. As the *Sun* says, lots of railroad presidents have been brass-pounders, and the training which they received at the key helped them in their rise.

At the same time, there is no need for the boys in the other branches to be discouraged; many and many a man has got to the top of the heap who started as a wiper, a section laborer, a car-checker, or in similar humble circumstances; and the training received in those jobs was likewise useful in positions of greater importance.

No matter how you start, you'll land right if you've got it in you. Railroad directors don't care how you deliver the goods as long as the goods are left on the doorstep regularly every coupon-clipping time, and stockholders are as glad to accept dividends that are made for them by a railroad president who is an ex-brakeman as they are to thumb over the green stuff which represents the efforts of an executive who started life as a brass-pounder.

Here's the *Sun* editorial:

Why do telegraph operators become railroad presidents? The question forces itself upon the mind through the reiteration of facts. As often as we read that the winds will be moderate and southerly, and that Villa is dead, just so often do we read that the new head of the so and so railroad began his business career as a sender of Morse messages. Bernet of the Nickel Plate, Calvin of the Union Pacific, Levey of the Western Pacific, these are three of this summer's crop of presidents who went, as a railroad poet might say, from the sounder to the sceptre. The list of distinguished railroad presidents of these and older days is full of operators: Van Horne of the Canadian Pacific, Hughitt of the Northwestern, Newman and Brown of the New York Central, McCrea of the Pennsylvania, Hayes of the Grand Trunk, Tuttle and Todd of certain New England lines.

How telegraph operators become railroad presidents would be easy to tell. Your operator hears everything, knows everything, does everything. He is aware how far a division superintendent may go in spirited debate, by wire, with the general manager. He comes to know upon what days the chief despatcher is afflicted with tantrums. He flags the night express on the brink of the washout, supplies the jolly brakeman from his own paper of fine cut, chops Mrs. Jones's telegram to ten words, fills the station stove, figures transmissisippi freight rates, sells excursion tickets and has an eye for the ladies. On Sunday afternoons, between the 2.46 and the 5.58, he plays first base on the town nine. Thus he acquires a rounded life, with the wisdom of near and far. Presently the boss of the division takes him into his own office and his doom is written. Nothing but the scythe or the bottle can prevent him from becoming president of the road.

Why he lets himself be hurried on down the path puzzles us. He wears better clothes as he goes on, but is obliged to pinch the fine cut surreptitiously. He joins a country club, but his old place in baseball is lost to him. The brakeman calls him Mister instead of Joe. Nobody flags the night express and he spends a week with a coroner's jury. Coming to the presidency, he finds that the rates east and west of Clinton, Iowa, instead of being horribly complicated, are merely horribly small. The eye that once was for the ladies is now cast languishingly at the Interstate Commerce Commission. He is fifty-five, practically fat, and plays golf. They all play golf, these presidents who were brass-pounders. It seems to be part of the doom.

All in all, the operator who falls to the position of president reminds one of some doughty adventurer who has been lured away from adventure. Time was, for him. As he sits in his mahogany inglenook, holding out his road's empty bowl to the Commerce Commission and begging for just a little more freight-rate gruel, one prefers not to remember the lad who was so free and lithe and gay.

But as to the reason why telegraph operators persist in doing as they do, we cannot say. Nor do we hope to change them. Probably it is the dreeing of their weird.

OUR DECENNIAL.

IN October, 1906, The Frank A. Munsey Company issued the first number of a brand-new kind of magazine. It was a magazine which was to deal exclusively with the railroad and with matters of interest to railroad men—"fiction, fact, and fancy of the rail." Whether the venture would succeed or not, no one knew.

It did!

With this issue the magazine enters upon its eleventh year, better, livelier, and more prosperous than ever. The editor can say this without tooting his own horn. He can lay claim to no personal triumph. He simply kept his ear to the ground; and what you, the railroad reader, wanted, he did his best to give you excellently and abundantly. He will continue along those lines.

As hitherto, this will be THE RAILROAD MAN'S MAGAZINE, in fact as well as in name

May we all be here a hundred years from now.

BOOK REVIEW.

FREDERICK J. PRIOR has just issued a volume on time-card and rule examinations, which covers all of the examination questions upon these subjects, as given in the book of rules of a typical large railroad.

Rulings are also included on the sixteen-hour law as well as questions and answers upon safety appliances and legal decisions affecting them.

The book forms part of Mr. Prior's series of self-educational text and reference works. Other numbers in the series include "Operation of Trains," "Easy Steps to Locomotive Engineering," "Construction and Maintenance of Railway Roadbed and Track," "First and Second-Year Mechanical Examinations," and "The New Third-Year Mechanical Examinations for Engineers and Firemen."

The new book, like all of its forerunners, is handy, authoritative, and complete.

"Complete Time-Card and Rule Examination," by Frederick J. Prior. Frederick J Prior, publisher, Hinsdale, Illinois, 125 pages. Cloth. $1.50, postage paid.

WHAT! ANOTHER?

JUST seems as if we can't keep these railroad brain-twisters out of the magazine. This time a soldier takes a shot at the subject; and as he writes from Tientsin, China, possibly it's one of those shots that the late Mr. Emerson referred to as "ringing round the world."

QUESTION: A man is riding the locomotive of a train traveling at the rate of one mile per minute and a man starts for him on the caboose of same train regardless of the length of same.

The man on the rear is a "Dick," the man on the head end is an escaped convict. The detective wants to take a shot at the man on the engine and finds out that the gun he has will only fire a shot at the rate of a mile a minute.

Now what we want you to do is to solve this question for us as you did in one of your previous issues. Will the man on the rear end of the train hit the man on the head end with bullet and train traveling at the same speed?

Please answer and oblige

A Member of Lodge 413, B. of R. T., Havre, Montana.

J. J. MURPHY.

China Expedition,
15th U. S. Infantry,
Company C,
Tientsin, China.

ANECDOTES OF MEXICO.

SOME months ago we published a series of articles by Walter Gardner Seaver, entitled "Railroading under Diaz," which, as any one with the normal amount of gray matter can guess, dealt with conditions in the steam-transportation field as they existed in Mexico at the time of the last stable government that distracted country has had. The series seems to have stirred a reader in a far country to reminisce; at any rate, he writes:

A word from a regular reader far away may interest you. I am installing electric tabulating machines in the railroad and other offices out here. Your magazine costs here 30 cents gold, but if it cost a dollar I would get it just the same

I was "railroading under Diaz" on the Mexican International round about 1906. Two incidents that happened on the International may interest you. The daily southbound passenger left Ciudad P. Diaz one ominously black night. Soon after the storm broke, and down the line stood two empty coal-cars.

The instructions were always to leave the hand-brakes on, as the air might not last out. This was not done, and the terrific wind blew these two cars on to the main, where the passenger would hit them, which it did. The engineer and firemen recovered, although buried beneath coal thrown from the tender some distance from the tracks

The other incident occurred in the shops at Diaz. Shade not being too plentiful and the sun very hot, four Mexicans slept under a repaired car after they had finished their dinner, using one rail as a pillow. Just before the one P.M. hooter sounded, the switch-engine coupled to the string and started away, with the result that there were at least two headless Mexicans.

Hoping to be back some time,

H. S. COURTNEY.

P O. Box 5275, Johannesburg,
South Africa.

BOOSTING AND TEACHING.

AS all but the very newest of our readers know—and maybe they know it too—railroads do a good deal more than haul people and freight around. One of their important jobs is to increase the tonnage in their territory by attracting new settlers and new industries, and increasing the wants of the people they serve.

Now some roads have gone still further; they not only boost, but teach. Putting wheels under agricultural colleges they transport the plant right up to the farmer's back door, to show him, without any loss of time on his part, how he can increase the yield of his land, his flocks and his herds—all of which, when increased, means more stuff for the railroad to haul.

A train that is typical of all these educational specials was recently sent out by the Union Pacific. Its work is described as follows in a letter to this magazine, written by Mr. W S. Basinger, General Passenger Agent of the system:

The Union Pacific's Silo, Dairy, and Live

Stock Special was a train run through Western Nebraska in cooperation with our State Agricultural College and the International Harvester Company of New Jersey.

We utilized the services of eighteen lecturers, who held one hundred and fifty-seven meetings and spoke to 14,876 people, men, women, and children, during the five days' trip.

The total number of pieces of literature distributed was 89,000; 28,000 of these covering general farming subjects, 49,000 pieces covering school subjects and 12,000 pieces covering subjects that are of interest in the home

The subjects lectured upon, generally, were the Silo, Corn, Ensilage, the Feeding of Ensilage, More and Better Dairy Cattle, Dairying, More and Better Live Stock, Live-Stock Feeding, Alfalfa, Sweet Clover, Pork Production, Sugar Beets, Conserving the Fertility of the Soil, Proper Rotation of Crops, Diversified Farming, *et cetera*, and Cooperation among farmers and townspeople generally.

At the women's meetings, Home Economics, a Good Home, Cold Pack Canning, *et cetera*, were discussed, and at the children's meetings, Gardening, Poultry, Potato-Raising, a Pig for Every Boy—in fact, boys' and girls' club work generally was presented.

This train consisted of a baggage car, a chair car, a dining car, two standard sleepers, and two officers' cars.

It was run for educational purposes solely, and, though many different subjects were lectured upon, the principal idea was to impress upon the father, mother, and child, whether living in the country or in the town, that each should work in harmony for the success of the family, and of the community; to carry on their work intelligently with brains, as well as with muscle—in other words, to endeavor to attain success through intelligent work and cooperation—and to be thrifty, likewise; the combination of the three B's—Brains, Brawn, and Banks—is a powerful one in the development of individuals and of communities.

W. S. Basinger,
General Passenger Agent, Union Pacific System, Omaha, Nebraska.

FLASHES FROM OUR READERS.

I have been a reader of your valuable magazine ever since it was published. I enjoy reading it very much. I could read a copy every week.

A Boomer Bake-Head and Dinkey Skinner

Please enter my subscription to the Railroad Man's Magazine. I enclose check for $1.00

This magazine is, without question, the finest thing in its line, and I will never miss a copy as long as you put it out.

I am just as glad to get it as something in the technical line like the *Railway Age Gazette*.

Warren M. Hamilton,
Vermont Academy,
Saxton's River, Vermont.

The Editorial Carpet is a very interesting feature of this grand magazine, and this is one of the subjects that always keeps a fellow wishing the tenth of the following month was due Please do not cut this out or get the wires grounded. However, you are at the throttle of this wonderful special.

"73's."

Harvey G Grove.
Boyertown, Pennsylvania.

Gee! But the August issue was a "hummer" The best yet. The story of "NY" telegraph-office is *great*. Let's have more of this style Give us something in respect to "CH" (Chicago), also Denver, San Francisco, Los Angeles, Omaha, *et cetera*. They will be appreciated by the brass-pounders.

Something relating to wireless once in a while won't go amiss.

Just keep on with the good work. We are enjoying the best of magazines immensely.

L. Nelson Grove.
Bechtelsville, Pennsylvania.

ADDRESSES WANTED.

Readers of the Railroad Man's Magazine *who make requests to locate missing relatives through these columns must abide by the following.*

All requests must be written in ink and a complete description of the missing persons given, as well as full name and age.

We will not publish these notices unless they are signed by the nearest living relative of the missing person, and we must be assured that every effort has been made to locate him through the various brotherhoods or associations to which he might belong

The person making the request must also give his or her complete address.

INFORMATION is wanted of the whereabouts of Wiemar Nutt, fifteen years of age about 5 feet 4 inches in height, about 120 pounds, light hair, gray eyes, olive complexion, very regular features. When last seen he was wearing gray knickerbockers, white sweater and black and white plaid cap. Any information concerning him will be appreciated by his mother, Mrs. A. V. Nutt, 139 North Elmwood, Kansas City, Missouri.

SONGS BY BARDS OF THE RAIL.

READERS have asked us to republish the following poem, and we shall be glad to do so if it bears upon the railroad, the telegraph, or the telephone:

"MY BLUE-VELVET BAND"

Another reader desires republication of:

"THE WRECK OF THE C. & O."

This poem begins somewhat like this:

When they got to Hinton the engineer was there;
George Allen was his name, with bright eyes and golden hair.

Will some friend please give us transcripts of these poems?

—THE EDITOR.

THE TWO ENGINES.

(The following lines were written in commemoration of the opening of the Pacific Railroad.)

WHAT was it that the engines said,
Pilots touching, head to head,
Facing on the single track,
Half a world behind each back?
This is what the engines said,
Unreported and unread.

With a prefatory screech,
In a florid Western speech
Said the engine from the West:
"I am from Sierra's crest;
And if altitude's a test,
Why, I reckon it's confessed
That I've done my level best."

Said the engine from the East:
"They who work best talk the least.
Listen! Where Atlantic beats
Shore of snow and summer heats,
Where the Indian autumn skies
Paint the woods with wampum dyes;
I have chased the flying sun,
Seeing all he looked upon,
Blessing all that he has blessed,
Nursing in my iron breast
All his vivifying heat,
All his clouds about my crest;
And before my flying feet
Every shadow must retreat."

Said the Western engine: "Phew!"
And a long, low whistle blew.

"Come, now; really, that's the oddest
Talk for one so very modest.
You brag about your East, you do.
Why, it's I who bring the East to you!
All the Orient, all Cathay,
Find through me the shortest way;
And the sun you follow here
Rises in my hemisphere.
Really, if one must be rude,
Length, friend, isn't longitude.

Said the Union: "Don't reflect, or
I'll run over some director."
Said the Central: "I'm Pacific;
But, when angered, quite terrific;
Yet, to-day we shall not quarrel,
Just to show these folks this moral:
How two engines—in their vision—
Once have met without collision.

This is what the engines said,
Unreported and unread,
Spoken slightly through the nose
With a whistle at the close.

AN UNSIGNED FRIEND AND WELL WISHER.

STICK TO YOUR MOTHER, JIM.

(Reprinted by request.)

STICK to your mother, Jim,
For she's getting old and gray,
And from her heart do not depart
Till she has passed away.
'Twas she that rocked the cradle, boy,
And watched her baby night and day;
'Twas her hand that warded death away.
Stick to your mother, Jim!

Stick to your mother, Jim,
While your steed of steel rolls on,
And on your brake you feel the weight
Of box-car flat and "gon."
Though you dream as you rush through the night and day,
Give no lass's love the right-of-way;
Be good to her, boy, for she's old and gray.
Stick to your mother, Jim!

Stick to your mother, Jim,
For the day may be near at hand
When the weight of years will become too great
And she'll pass to another land.
Let no word or action hold its sway
That will cause remorse some other day;
Be good to her, Jim; keep her bright and gay.
Stick to your mother, Jim!

"I didn't know it was zero"

Not to know that "Mr. Zero" is outdoors is the common experience of all early-risers who have bought our outfits. An Ohio mother writes: "We're having a two days' blizzard—too risky for the children to go out to school—but it's like June ALL through the house, thanks to your ideal heating."

If the old heater has about given out—liable to collapse some cold day next winter—why not protect your home and family health by at once putting in an outfit of

AMERICAN RADIATORS & IDEAL BOILERS

The Ideal heated house is kept steadily at 72 degrees in all rooms, halls, bays, and corners, day or night. Old King Winter is kept where he belongs—*outside!*

Bodily comfort is desired by every man, and may be enjoyed by the man in the modest cottage, by the man in the mansion—the price is based on the size of the outfit—the heating results are always Ideal!

Due to the scientific design and construction of IDEAL Boilers, the amount of air mixing to give complete combustion, the large coal-holding capacity, the self-cleaning, fire surfaces, and the automatic, perfect control of heat, these outfits are endorsed by all architects and engineers, and used in over a million buildings, at home and abroad. They are *fully guaranteed*, yet cost no more than inferior makes. Accept no substitute.

A No. 5-22 IDEAL Boiler and 450 ft. of 38 in. AMERICAN Radiators costing the owner $336, were used to heat this cottage. At this price the goods can be bought at any reputable competent Fitter. This did not include the cost of relief pipe valves, freight, etc., which vary according to climatic and other conditions.

A lifetime of lowest heating cost

IDEAL Boilers and AMERICAN Radiators are easily placed in any building, *old* or new, city or country, cottages, residences, apartments, office and public buildings, hotels, churches, clubs and factories. You will get a big fund of heating information from our (free) book "Ideal Heating." Your inquiry puts you under no obligation to buy

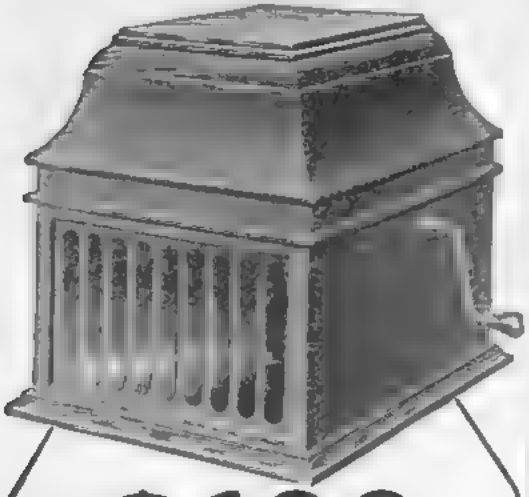
$150 Stationary Cleaner

Ask for catalog of ARCO WAND Vacuum Cleaner. First genuinely practical Cleaner on market—is connected by iron suction pipe to all floors; and will last as long as your building

Showrooms and warehouses in all large cities

AMERICAN RADIATOR COMPANY

Write Department 23
816-822 S. Michigan Avenue, Chicago



$1.00

and You Keep This Superb

New Edison

An astounding offer—the great New Edison with the new Diamond Stylus reproducer and your choice of all the brand new Diamond Amberol Records will be sent to you on **free trial without a penny down.** The **finest**, the **best** that money can buy at very very much less than the price at which imitations of the genuine Edison are offered—**a rock-bottom offer *direct* from us.**

Entertain Your Friends

Hear all the latest up-to-date song hits of the big cities. Laugh until the tears stream down your face from laughing at the funniest of minstrel shows. Entertain your family and your friends with everything from Grand Opera to Comic Vaudeville — then if you choose, send the outfit back to us at our expense.

Rock-Bottom Direct Offer

If you wish to keep Mr. Edison's superb new instrument, send us only $1.00 after the free trial. Pay the balance on the easiest kind of monthly payments.

Think of it — a $1.00 payment, and a few dollars a month to get this latest news via outfit! The Diamond Stylus reproducer, the new enlarged Diamond Amberol Records, all the musical results of the highest priced outfits, yes, the greatest value for $1.00 down, balance on **easiest monthly terms.** Convince yourself — a free trial first! No money down, no C. O. D., not one cent to pay us unless **you choose** to keep the instrument.

Our *New* Edison Catalog Sent *Free*

Your name and address on a postal or a letter (or just the coupon) is enough. No obligations in asking for the catalog. Get this offer — **while this offer lasts.** Fill out coupon today.

F. K. BABSON
Edison Phonograph Distributors
1097 Edison Block
Chicago, Ill.

Canadian Office:
355 Portage Ave.
Winnipeg,
Manitoba

To
F. K. Babson
Edison
Phonograph Distributors
1097 Edison Blk.
Chicago, Ill.

Gentlemen: Please send me your New Edison Catalog and full particulars of your free trial offer on the new model Edison Phonograph.

Name.....

Address.....

.....

Law-Trained Men Rule In Business and Public Life

Who are the best paid among all professional men? LAWYERS. Who occupy the highest positions in business life? LAW-Trained men. Who are our leading executives—Governors of States, Congressmen, Senators, Cabinet officials? Men with LEGAL training.

Then what profession offers the broadest possibilities for YOU? LAW of course. LAW has opened the way to positions of honor and profit for more men than any other profession or business. It will do the same for YOU.

Earn $3,000 to $10,000 a Year!

ACT! Enter this success-winning, big income-producing profession NOW! Today, more than ever before, LAW offers the **shortest route** to the **greatest success**—and with the **least expenditure of time and money.** Don't remain in the small-job, small-pay class any longer. Begin NOW to build a career of prosperity, power and independence.

We Train You By MAIL!

at home, in your spare time to acquire a **legal training** and become a practicing lawyer, a successful business man, a prominent statesman, or to qualify as a Legal Counselor.

Our method of Home Training insures your success—first because the LaSalle text is edited and written in plain, easy-to-understand language. Second, because it is prepared by such noted legal educators as James Parker Hall, Dean of University of Chicago Law School, James DeWitt Andrews, former member faculty Northwestern University and over 20 Law School Deans, Professors in famous resident colleges and famous legal authorities of Bar and Bench. Third, because we guarantee to coach free until successful any graduate failing to pass bar examinations.

We have successfully trained thousands of men and women in law. Among our graduates are men enjoying positions of honor in political, public and business world. It doesn't matter what your vocation is now, we can help you to the same end. Send coupon for facts that tell how.

Money-Back Guarantee Bond

So thorough is the LaSalle Home Study Course—so exceptional has been the success of LaSalle students—that we issue a legal, binding guarantee to refund the entire tuition fee if, after you complete the Course, you are not perfectly satisfied. This guarantee is backed by our entire capital and resources of more than two million dollars.

Modern Law Library Included FREE

14 massive law volumes—"AMERICAN LAW AND PROCEDURE"—standard size—9½x6½ inches—bound ¼ sheep. All branches of Law are fully covered. This work cost us over $50,000.00 but is FURNISHED YOU AT ONCE on your enrollment WITHOUT ADDITIONAL COST.

FREE COMPLETE COURSE IN PUBLIC SPEAKING

Our training by mail, will positively teach you the fine art of persuasive speech. Every Lawyer every successful man should be a forceful speaker. Our course is prepared by Frederick B. Robinson, A. B., A. M., Ph. D., Professor Public Speaking at College of City of N. Y. Write and learn how you can NOW secure this valuable course, absolutely free, if you become one of our new students.

LaSALLE EXTENSION UNIVERSITY
Dept. 1065-F Chicago, Ill.
(The World's Greatest Extension University)

Without obligation on my part, send me by return mail, information concerning your Course in Law with the free books, Evidence and Valuable Law Guide, also concerning your offer of FREE Course in Public Speaking.

NAME .....

ADDRESS .....

CITY..... STATE.....

RB

How Present-Day Parents Keep the Hat-Rack Filled

THESE are times when the Home must win against a host of outside allurements. Yet it can eclipse them—and Carom and Pocket Billiards played at home are doing it.

You should send for our free color-book and learn the life-time charm of playing billiards; learn the delight of parents, boys and girls.

$5 Brings a Brunswick Home

Billiard Table

$2.50 Monthly Soon Pays the Balance

As the nights grow longer, let your sons and daughters entertain at home. Let carom or pocket billiards brighten your own leisure hours, and bring you perfect health.

You can afford a small payment now as well as later. So why postpone these hours of merry conquest? Complete high-class Playing Outfit of balls, cues, etc., included without extra cost.

No Extra Room Needed

Brunswick Tables are scientifically built. Accurate angles, fast, ever-level billiard beds and famous quick-acting Monarch Cushions. Beautiful oak and mahogany richly inlaid—masterful cabinet work throughout.

"Quick Demountables" can be set up anywhere and taken down easily. "Convertibles" serve as perfect Library or Dining Tables when not in play. Celebrated "BABY GRAND" Brunswick—a home-size regulation table. Write for our color-photo book today.

Send This Free Coupon

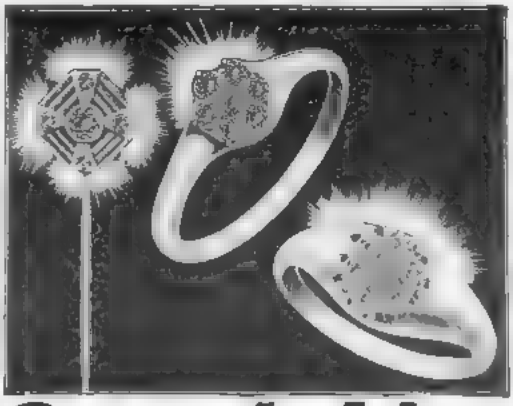
Don't mistake toy imitations for scientific Brunswicks. If you are not sure which store in your town supplies the genuine Brunswick, see these tables in our beautiful color book, Billiards—"The Home Magnet." **It's free.**

Full details, play-as-you-pay plan and free trial offer all fully told. Write or send this coupon at once.

The Brunswick-Balke-Collender Co.
Dept. 37N 623-633 S. Wabash Ave., Chicago
Send free, your color-photo book
"Billiards—The Home Magnet"
and tell about your home trial offer.

Name .....

Address .....



Superb Idea

In Setting. Diamonds arranged to show their beauty to the utmost. The setting which has always been most admired. *The diamonds are set so closely and skillfully that the facets shape up like one huge diamond.* Now offered at net prices, direct to you. No jobbers—no retailers to pay. Send for our *Diamond Book*, listing exquisite

Clusters

Pins and rings set in solid platinum. Every stone a brilliant of superb quality. Splendid opportunity now to buy these wonderful, extra brilliant cluster diamonds. Full information free. Send the coupon today for Diamond Book. Do it now.

Diamonds

Rings in all styles of settings, Tiffany, Belcher, etc., LaValieres, Brooches and other diamond jewelry. Every diamond a superb gem. Selected by a famous expert. Perfectly cut to give a maximum brilliancy. Richly mounted in solid gold and platinum settings.

Free Examination Not a cent down—you see the diamond before you accept it. We want you to compare these diamonds with others at twice their price. Write today.

$2.50 Monthly

Yes, only $2.50 a month will make you the wearer of a beautiful diamond. Other terms, $3.50, $4.50 and up—and middlemen's profits cut out.

Write

For Net Price List and Diamond Book

Shows the different gems, styles of mountings and gives our *best net prices* with terms of payment. Do it now—today

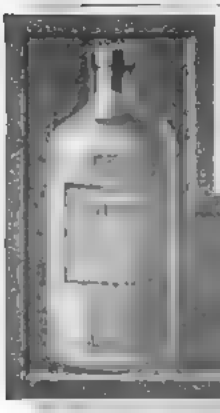
BURLINGTON WATCH CO.
Dept 1097
Chicago, Ill.

Burlington Watch Co.
Dept. 1097
Chicago - Illinois

Without obligations send me your net price offer on diamonds; also send Diamond Book.

Name .....

Address .....



An infected wound is usually a neglected wound. To prevent infection of cuts and abrasions, promptly use

LISTERINE

The Safe Antiseptic

RIDE a RANGER

Bicycle and know you have the best. Buy a machine you can prove by actual test before accepting.
DELIVERED FREE ON APPROVAL and *30 days' trial.* No expense to you if you do not wish to keep it.
LOW FACTORY COST, great improvements and values never before equaled in our models.
WRITE TODAY for our big catalog showing our complete line of 1917 bicycles, **TIRES,** sundries and parts, and learn the wonderful low prices and new offers and terms we will give you. Do not buy until you know what we can do for you. Write a post card now.
MEAD CYCLE CO. DEPT. K-31, CHICAGO

Inventions Wanted

Your ideas may bring wealth. Send sketch for free advice. Patents secured through our Credit System, advertised free in "Popular Mechanics" Magazine.
BOOK FREE
WATERS CO., 4103 Warder Bldg., Washington, D. C.

Safety First—Wear "All Sports" Suspensory

Every railroad man knows the personal danger which lurks in the constant pounding of a heavy train.
Protect yourself today. Send for **"All Sports,"** the best popular priced suspensory made.
Perfect fitting, instantly adjusted, light, durable, washes like new **is sold at 25c, 5 for $1.00.** Satisfaction guaranteed or money back.

Box 3 R, Station W — **All Sports Supply Co.** — BROOKLYN, N. Y.

Pay as You Wish

We'll send you a genuine Lachnite for you to wear for 10 days. If you can tell it from a real diamond, send it back at our expense. Costs but a penny a day if you decide to keep it, pay only a few cents a month. Write for catalog.

Genuine Lachnite Gems

Set mounted in 14K solid gold. Write today. WRITE TODAY.
H. Lachman Co., 12 N. Michigan Av., Chicago Dept 1037

Without Toupee

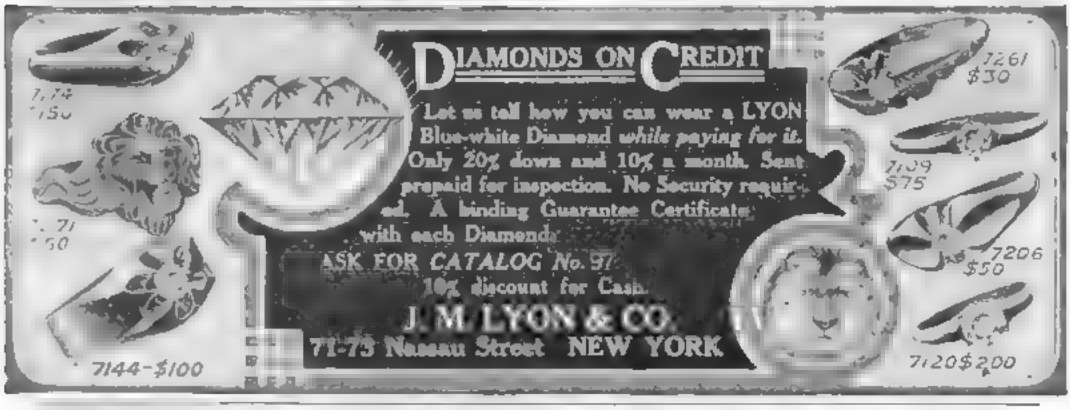
Improve Your Appearance

By Covering Your Bald Spot With a Wig or Toupee.

Protect your head against Catarrh and Neuralgia, by adding the hair and get perfect ease and comfort.

R. Walter Solomon
102 West 42nd Street, N. Y.

Wearing Toupee


DIAMONDS ON CREDIT
Let us tell how you can wear a LYON Blue-white Diamond while paying for it. Only 20% down and 10% a month. Sent prepaid for inspection. No Security required. A binding Guarantee Certificate with each Diamond.
ASK FOR CATALOG No. 97
10% discount for Cash.
J. M. LYON & CO.
71-73 Nassau Street NEW YORK
7144-$100
7120 $200
7206 $50
7139 $75
7261 $30

In answering any advertisement on this page it is desirable that you mention RAILROAD MAN'S MAGAZINE.

Rent or Buy

Five Year Guarantee

Sensational Typewriter Offer

Everyone needs a typewriter. Write [illegible] arguments and law suits. Earn extra money typing manuscripts, writing scenarios, etc., with the acknowledged leader.

UNDERWOOD Standard Visible

Unusual value. Must be seen and used to be appreciated. Let us send one on approval. If you find it right in every way to criticise, return machine at our expense after

10 Days' FREE Trial

Machine must sell itself on merit. You can *Rent* applying rental on purchase price, or *Buy* For Cash or Easy Payments at

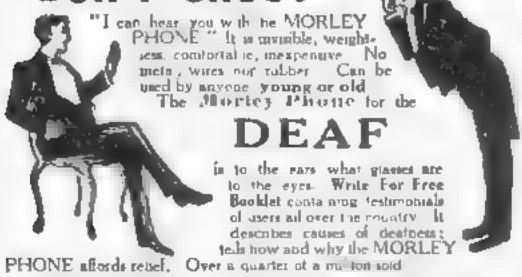
Less Than Half Price

Write for information about Big Offer 507.

Typewriter Emporium, Chicago, Ill.

150,000 Satisfied Emporium Customers
Established 24 Years

"DON'T SHOUT"



"I can hear you with the MORLEY PHONE." It is invisible, weightless, comfortable, inexpensive. No metal, wires nor rubber. Can be used by anyone young or old. The Morley Phone for the

DEAF

is to the ears what glasses are to the eyes. Write For Free Booklet containing testimonials of users all over the country. It describes causes of deafness; tells how and why the MORLEY PHONE affords relief. Over a quarter of a million sold.

THE MORLEY CO., Dept. 759, Perry Bldg., Phila.

DEAFNESS IS MISERY

I know because I was Deaf and had Head Noises for over 30 years. My invisible Anti-septic Ear Drums restored my hearing and stopped Head Noises, and will do it for you. They are My Megaphones. Cannot be seen when worn. Easy to put in, easy to take out. Are Unseen Comforts. Inexpensive. Write for Booklet and my sworn statement of how I recovered my hearing. **A. O. LEONARD**

Suite 231, 1565th Ave. N. Y. City

SEXUAL KNOWLEDGE A $2 BOOK FOR ONLY $1

By Winfield Scott Hall, Ph. D. Noted Authority and Lecturer. PLAIN TRUTHS OF SEX LIFE that young men and young women, young wives and husbands, fathers, mothers, teachers and nurses should know. Sex facts hitherto misunderstood. Complete 320 pages illustrated. In plain wrapper, only $1, postage 10 cents extra.

AMERICAN PUB. CO., 419 Winston Bldg., Philadelphia

LEARN TELEGRAPHY

AT HOME — AT HOME

In shortest possible time and at a trifling cost. Morse or Wireless. **OMNIGRAPH AUTOMATIC TRANSMITTER**, connected with Sounder or Receiver sends unlimited Morse or Continental messages at any speed. Used by expert operators worldwide. Adopted by U. S. Government. Six styles. Catalog free.

OMNIGRAPH MFG. CO.

39-41 Cortlandt St., New York

Wanted: An Idea

Who can think of some simple thing to patent? Protect your ideas, they may bring you wealth. Write for "Needed Inventions" and lists of Patent Buyers.

RANDOLPH & CO., Pat. Attorneys, Dept. 138, Washington, D. C.

War prices smashed!

BARNARD & CO. offer Genuine Blue White Perfect Cut DIAMONDS $88 Per Carat

These prices ½ to ⅓ below retail:

SPECIAL 14k Solid White Diamond Lady's Ring . . . $17.25

SPECIAL 14k Solid White Diamond Ring . . . $42.75

SPECIAL 14k Solid White Diamond Ring . . . $71.13

⅛ carat	$6.25	¾ carat	$64.25
¼ carat	15.50	1 carat	88.00
⅜ carat	29.00	1½ C.	138.00

Don't pay war prices! **Direct importing and cut profits** allow us to continue our startling before-the-war prices for a short time longer. If you expect to invest in a fine diamond between now and Xmas, get our Free book at once. Learn how we attain these low prices. Our popular Blue White quality for only $88 per carat.

SEND NO MONEY!

Examine FREE any diamond bargain in our stock at your bank or express office. Not one penny of cash necessary for the slightest obligation to buy. Let us prove **at our expense** all our wonderful values are the equal or best of the diamond business.

Bankable MONEY BACK Guarantee

is the **only one** of the diamond business which you can take to any bank and have it appraised. If you want to exchange any diamond BARNARD & CO. sell also for **forever!** Let us explain and convince you how to know **legally certified!**

Gent's Diamond $1.88
14k Baby Ring $2.88
14k Child Ring $3.88
Mounting Size

1917 BOOK of DIAMONDS, FREE!

Write for this free book even if you aren't ready to buy. Tells you the **inside facts** about diamond prices and values. The only [illegible] guide and jewelry. A postal will bring [illegible] volume by return mail.

BARNARD & CO., S.W. Cor. Wabash & Monroe, Dept. 1008, CHICAGO

VOSE PLAYER PIANO

The VOSE PLAYER PIANO

[illegible] has one of the great most perfect player [illegible] that can be obtained. [illegible] expression [illegible] and [illegible] the singer. This [illegible] player [illegible] to the [illegible] ty of the Vose Piano [illegible] Vose family.

We challenge comparisons

Time payments if desired. Write for catalog, free of charge. Ask for our name. We deliver at your home or place of business [illegible]

VOSE & SONS PIANO COMPANY
162 Boylston Street *Boston, Mass.*

In answering any advertisement on this page it is desirable that you mention RAILROAD MAN'S MAGAZINE

The Railroad Man's Dollar

Do you get the most for each dollar you spend? We have on our list, and we are in touch with, hundreds of firms in every line of business in the country. No matter what you want to buy (see the suggestion list on this page), The Railroad Man's Magazine will help you with information and advice that will insure economical purchase and complete satisfaction. *This service absolutely FREE*—All you have to do is to fill out the coupon below and mail it to the "Railroad Man's Dollar Department." By return mail we will gladly put you in touch with several firms that will give you complete information that will aid you in making a choice of the best articles and biggest values in their various lines. In a series of trade talks appearing on this page the Dollar Dept will endeavor to give timely hints to readers.

STOCKS AND BONDS

How can I invest my savings and where shall I place them? These are the questions that many ambitious and careful persons should ask themselves. It is well to remember, "It is not what we earn, but what we save that makes us rich." In days thankfully gone by when the columns of the press and Uncle Sam's mails were open to the unscrupulous "investment dealer," there were apparently more ways for the person with a comparatively small amount to get rich than today. There is, however, a wide breach between "getting rich quick" and "getting rich sure." One is gambling. The other is saving

STOCKS

Shares of stock represent an ownership in a corporation and dividends are paid upon them as the company's earnings warrant it.

Public interest in the stock market, which was long confined to men of great wealth, has broadened. Men of moderate means are now learning that they can invest in quantities of stock in less than one hundred shares. This is called "odd lots", such as one, five, ten and ninety-nine shares.

BONDS

A bond is the obligation of the issuing company, and is usually secured by a mortgage on its property, and must be paid at face value, at a specified time.

It has therefore a tangible, intrinsic value at all times, and the interest upon it is a charge upon the company's earnings and is paid at a fixed rate at specified intervals.

It is probably a matter of only a short time before all corporations will issue their bonds in hundred dollar pieces. At present not all do, but some of the best corporations now have hundred dollar bonds and there is a wide variety from which to choose.

When you buy hundred dollar bonds, you are buying the same bonds that another buys when he invests his $1,000, or $10,000. You get a bond, issued by the same company, on the same property. The interest on the principal is payable at the same time. The security is identical. We will be glad to send any one booklets issued by reliable brokerage houses that will give full particulars as to the various ways for one to invest his money

We Can Help You Buy Any of These Things

Artificial Limbs
Agents Articles
Automobile School
Bicycles
Billiard Tables
Boats
Bonds
Building and Construction
Cameras
Cigars
Civil Service Schools
Correspondence Schools
Dentistry
Electrical Goods
Engineering Instruction
Firearms
Food Products
Fountain Pens
Fraternal Insignia
Furniture
Gloves
Gun Clubs
Gun Powder
Hand Traps
House Furnishing
Investments
Jewelry
Lamps
Leather Goods
Marine Engines
Motorcycles
Motor Boats
Musical Instruments
Mail Order Houses
Overalls
Patent Attorneys
Photographs
Pianos
Pipes
Pocketbooks
Poultry
Railroad Books
Salesmen's Courses
Shoes
Silverware
Sporting Goods
Stocks
Telegraphy
Tobacco
Trap Shooting
Typewriters
Uniforms
Washing Machines
Watches
Wearing Apparel
Wireless

Write name of each article together with name and address plainly in coupon below

Signing this coupon puts you under no obligation to buy.

The Railroad Man's Dollar Department, 8 West Fortieth Street, New York

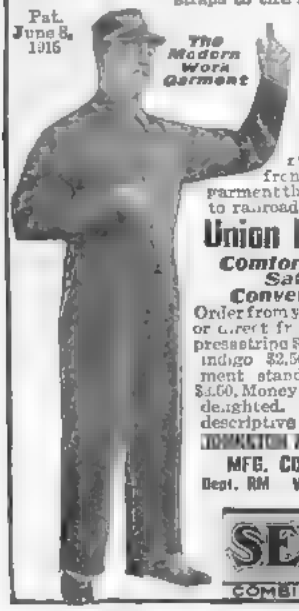
Gentlemen:
I am considering the purchase of the following articles, and would like to have your information and advice

Name ..... Occupation .....

Address .....

Here's the Work Suit of the Hour!

The most comfortable on earth! Neatest looking. No belt to bind. No suspender straps to tire shoulders.



No coat tails to bunch or get caught in machinery. No double thickness at waist or front. Just the garment that appeals to railroad men.

Patented bat-wing drop seat shirt showing pocket jacket effect.

Skirt up showing suspenders which are attached to back of jacket.

Showing the convenient drop seat arrangement

Union Made

Comfortable, Safe, Convenient

Order from your dealer or direct from us. Expressstring $1.5 Sand indigo $2.50; Government standard k $4.60. Money back if not delighted. Write for descriptive circular.

JOHNSTON & LARIMER MFG. COMPANY, Dept. RM Wichita, Kan.

SENSIBLE

COMBINATION WORK SUIT

EVERY RAILROAD MAN NEEDS A

SUMMIT Knit-Nek Vest

Warm — Comfortable Light Weight

For the man who must be out for several hours during the cold weather days. Get a SUMMIT Knit-Nek Vest.

It will keep you warm at all times and easy use of your arms and body.

The sleeves are made of soft, fine wool and the body is leather lined.

The patented Knit-Nek and Wristlets protect the throat and wrists.

Buy one and be comfortable.

Sold by dealers everywhere.

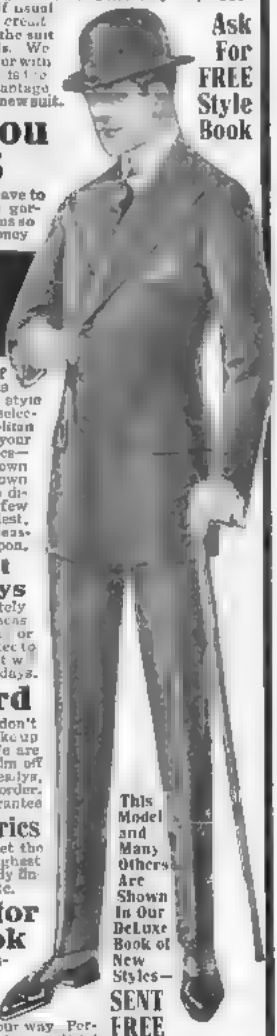
Interesting style book sent free on request.

Guiterman Bros.
Dept. R
ST. PAUL, MINN.

---

6 Tailor-Made-To-Order 6 MONTHS TO PAY

Don't think of money. Don't let money keep you from getting a new suit. WE TRUST YOU anybody. Don't matter who you are or where you live. We'll make you the best and most stylish, made-to-order suit for less than half usual prices—and on the most liberal credit terms ever known. You get the suit first and pay for it afterwards. We don't bother with references or with collectors. Your honor and your word is the only security we ask. Take advantage of this offer. Let us make your new suit.



Ask For FREE Style Book

We Save You $15 to $25

or about half what you would have to pay for ordinary ready-made garments. And you pay us on terms so easy that you'll never miss the money.

Only $2.50 PER MONTH

Send coupon for DeLuxe Book of Styles and full particulars of this sensational offer. When the style book comes, make your style selection from the late Metropolitan Fashion Plates. You have your choice of the swellest fabrics—many of them exclusive—shown nowhere else. Take your own measure, according to simple directions. Send it to us. In a few days we'll ship you the swellest, hand-tailored made-to-your-measure suit you ever laid eyes upon.

Every Suit Perfect and Ready in 7 Days

We build your suit separately. Study your figure from your measurements. Whether you are tall or short, stout or slim, we guarantee to fit you perfectly. And the suit will be already for you to wear in 7 days.

$1,000 Reward

to anyone who proves that we don't cut right from the bolt and make up your suit in our own shop. We are different from others, who palm off altered ready mades or semi-readys, claiming them to be made-to-order. Remember this. We also guarantee

Highest Grade Fabrics

In dealing with us you also get the best of everything. The highest grade fabrics—interlinings, body linings, sleeve linings, buttons, etc.

Send Coupon for Free Style Book

and actual cloth samples of beautiful weaves and patterns. Book gives you details of our sensational offer. Explains simple directions for taking your measure. Easy to order our way. Perfect fit guaranteed. Don't delay. Send Coupon today. You get your new suit so much quicker. Our prices save you half. Our credit gives you six months to pay. Mail Coupon NOW!

This Model and Many Others Are Shown In Our DeLuxe Book of New Styles—

SENT FREE

For The Coupon

MAIL COUPON NOW!

Stanley-Rogers Co.,
1015 Jackson Blvd.
Dept. 542
Chicago, Ill.

Mail Coupon Now

STANLEY-ROGERS CO.,
1015 Jackson Blvd. Dept. 542 Chicago

Please send me FREE, your new DeLuxe Style Book and full particulars of your offer.

Name.....

Address.....

Guaranteed Railroad Watch ON CREDIT

THE FAMOUS B. W. RAYMOND MOVEMENT
GUARANTEED TO PASS INSPECTION

Why pay retail dealers prices for a Standard Railroad Watch? Save money through our **Direct to you** way of payment plan. We will sell you this guaranteed B. W. Raymond Lever Set **19 jewels,** Montgomery R. R. adjusted to five positions, temperatures and isochronism, at less cost on small monthly payments, than the average retail asked for cash down.

NO MONEY IN ADVANCE

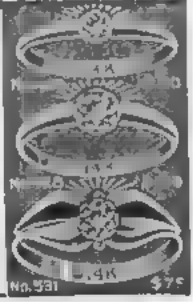
Examine it carefully. If you decide it is not the biggest bargain you ever saw, **it won't cost you a cent!** You must be satisfied first. If you want it send us $2.50 and pay a little down and the rest in easy monthly payments, **a few cents a day.** You wear the watch right from the start. **No Security. No Red Tape.** Your credit is good. Write today for full particulars of this **Great Watch Offer** and our beautiful DeLuxe FREE BOOK, the

GREATEST WATCH, DIAMOND and JEWELRY BOOK EVER PUBLISHED

We will sell you any Standard Watch, Diamond or other article of Jewelry on our Liberal, Easy Payment Plan. FREE EXAMINATION. **No Money in Advance.** Everything at Rock Bottom Prices. Direct to You. Write today.

L. W. SWEET & CO., INC., DEPT. 2 2 and 4 MAIDEN LANE, NEW YORK CITY

"THE WORLD'S GREATEST DIAMOND MERCHANTS"



WANTED-IDEAS

Manufacturers are constantly writing me for new ideas protected by **OWEN PATENTS.** Send for my free literature and read their wants.

FREE! Three finest patent books published! 72-page guide "Successful Patents," "Stepping Stones" (containing list of hundreds of inventions wanted, tells the plain truth about prizes, reward offers, etc.) and "Patent Protection" (tells how to sell your rights, chief causes of failure, etc.) All sent *free upon request.*

Very highest references. I help my clients sell their patents or dispose of their applications. Advice free. No obligation incurred by writing me. Free manufacturing facilities. No charge for report as to patentability, practicability, etc.

RICHARD B. OWEN, 71 Owen Bldg., Washington, D. C.

Relief to Ruptured People

Any appliance is a truss. Ruptured people must wear some kind of support. Our New Sponge Rubber Pad (pat'd) is velvety, soft to the skin, pliable, cannot chafe, extremely comfortable, is applied to ruptured parts with less pressure, is sanitary, long wear. Massages the ruptured parts, allows blood circulation and produces many cures.

New Scrotal Pad Needs No Leg Strap

Our new scrotal pad (pat'd) holds 8 out of 10 cases of hernia perfectly without strap between legs.

Free Sample Pad A Sample Akron Sponge Rubber Truss Pad (pat'd) will be sent absolutely FREE upon request. Also booklet "Relief to Truss Users." It's full of helps. Ask your dealer or write us.

THE AKRON TRUSS CO. Dept. 490 Akron, Ohio

Railroad Men

Don't accept a watch that won't pass inspection. Send and get an Official Standard 5 Point R. R. Watch at the lowest price on the Easiest Terms ever offered. We'll send you an Extra Fine 850 Factory New Thin Model

21 Jewel Illinois, Elgin

or Hamilton Masterpiece, the finest finished, handsomest, Accurate and Durable watches ever sold at the price. Constructed of the finest material by the Greatest Watch Makers that ever trued a hair spring. Adjusted to Heat, Cold, Isochronism and 5 positions. Guaranteed to pass R. R. Inspection anywhere. In a Superfine 25-Year Gold-filled case for only $2.50 down and $5 a month for 8 mos. Look what you save! And you enjoy your watch while paying for it without missing the money. Send today for your choice of these remarkable Ad-vance Watches for Free Inspection before you pay a penny. Satisfaction Guaranteed or Money Back. Write

SUTTON WATCH CO., 203 Lincoln Bldg., Louisville, Ky.

The Naturalness of HANGER Improved Limbs

Do you realize that you are constantly meeting people who are wearing **Hanger Improved Limbs?** Probably not for they allow such perfect freedom of movement and such absolute control of action that their use is indistinguishable. They are backed by a guarantee of unusual scope and by 52 years' experience in manufacturing and wearing artificial limbs.

If you have had the misfortune to be crippled in any way at all, write for our interesting book "Nature's Rivals." Sent free on request.

J. E. Hanger, Inc. 227 G St., Washington, D. C.

Factories in St. Louis and Atlanta

Mailing Cards *vs.* Classified Advertising

It would cost more than $11,500 to send a post-card to the more-than-a-million homes in which "The Munsey Magazines" are read every month. Advertisers who want to cover the same ground for $17.42 are using this short cut:

	Line Rate
MUNSEY'S MAGAZINE	$2.00
RAILROAD MAN'S MAGAZINE	.80
THE ARGOSY	1.30
ALL-STORY WEEKLY	.60
	$4.70

Special combination rate $4.49 per line. Less 3 per cent cash discount

Minimum space accepted, four lines. Ten per cent discount for six consecutive insertions. 3% for cash.

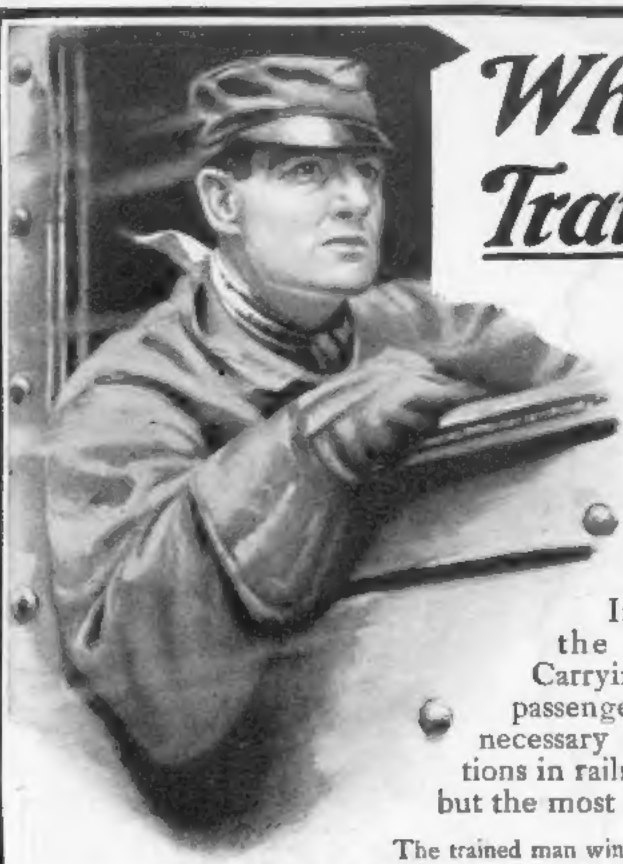
WRITE FOR THIS BOOKLET

"A New Force in Business," that gives full particulars about the effectiveness of Classified Advertising in "The Munsey Magazines."

The Frank A. Munsey Company

8 West Fortieth Street, New York

In ordering any advertisement on this page it is desirable that you mention RAILROAD MAN'S MAGAZINE



Where the Trained Man Wins

One of the country's largest railway systems recently announced that in a single year it had carried one hundred and ninety million passengers without a single fatality.

In the railroad business it's the *trained* man who wins. Carrying hundreds of millions of passengers every year, it is absolutely necessary that the responsible positions in railroading be filled with none but the most highly trained men.

The trained man wins. Whether you are in the engineering, operating, maintenance or clerical departments, your advancement will depend largely on the thoroughness of your training. And whether you are going to be a trained man or not—whether you are going to advance or stand still—is largely a matter for *you* to decide.

If you really *want* a better job and are willing to devote a little of your spare time to getting ready, the ***International Correspondence Schools*** can help you. More than two hundred of the railroad systems of the United States and Canada have indorsed the ***I. C. S.*** method of instruction and recommended it to their employees.

You're ambitious. You want to get ahead. Then, don't turn this page until you have clipped the coupon, marked the line of work you want to follow and mailed it to the I. C. S. for full particulars.

Marking the coupon is simply the act of investigation—in justice to yourself you can't afford to do less—and it doesn't obligate you in the least.

Mark the Coupon NOW

TEAR OUT HERE

INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 5924, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

☐ Locomotive Engineer	☐ R. R. Agency Accounting
☐ Locomotive Fireman	☐ R. R. Genl. Office Acc'ting
☐ Traveling Engineer	☐ Bookkeeper
☐ Traveling Fireman	☐ Stenographer and Typist
☐ Air Brake Inspector	☐ Higher Accounting
☐ Air Brake Repairman	☐ Mathematics
☐ Round House Foreman	☐ Good English
☐ Trainmen and Carmen	☐ Salesmanship
☐ Railway Conductor	☐ Advertising Man
☐ Mechanical Engineer	☐ Civil Service
☐ Mechanical Draftsman	☐ Railway Mail Clerk
☐ Machine Shop Practice	☐ Electrical Engineer
☐ Boiler Maker or Designer	☐ Electrician
☐ Steam Engineer	☐ Electric Wiring
☐ Steam-Electric Engineer	☐ Electric Lighting
☐ Civil Engineer	☐ Telegraph Expert
☐ Surveying and Mapping	☐ Mine Foreman or Engineer
☐ R. R. Constructing	☐ Metallurgist or Prospector
☐ Bridge Engineer	☐ Chemical Engineer
☐ Architect	☐ Agriculture ☐ Spanish
☐ Architectural Draftsman	☐ Poultry Raising ☐ German
☐ Contractor and Builder	☐ Automobiles ☐ French
☐ Structural Engineer	☐ Auto Repairing ☐ Italian

Name_____

Occupation & Employer_____

Street and No._____

City_____ State_____

If name of Course you want is not in this list, write it below.

R I

SATURDAY SEPTEMBER 16 TEN CENTS
ALL-STORY WEEKLY
The West at Its Best
The Short Cut
by Jackson Gregory
Author of "Wolf Breed," "The Square Dealer," etc.

"The Short Cut" is a murder mystery, but it involves neither police nor detectives. There is also another of the "Roxey Malone" series, entitled "The Headless Horse." "The Taboo and King Candy" is a pleasing little Hawaiian story and one all will like.

In the Sept. 16th All-Story

The Frank A. Munsey Company, 8 West Fortieth St., New York

Diamonds $2.50 On Credit A Month

Your credit is good with us. You wear the Diamond while paying for it at the rate of only eight cents a day.

"DIAMONDS WIN HEARTS"
A Diamond is the ideal gift for a loved one, it lasts forever, and every day reminds the wearer of your regard and good judgment.

Rock Bottom Prices
Easy Credit Terms

Our import prices "direct from the mines to you" cut out all the wholesaler's and retailer's profits. You get the benefit of this saving along with our liberal credit terms—eight months to pay—and you wear the Diamond while paying for it. Our large catalog is free, write for it.

FREE Examination

You don't pay one cent until you see and examine any article you desire right in your own hands. If you like it pay for it on our easy credit plan. If not entirely satisfied return at our expense.

GET OUR GREAT 116 PAGE CATALOG. It contains over 2,000 beautiful illustrations of Diamonds, Watches, Solid Gold Jewelry, Silverware, Novelties, etc.—all the latest and most up-to-date designs at our importer's bargain prices—and easy terms of payment. Send for catalog today before you forget. IT IS FREE.

LOFTIS BROS & CO. Estd 1858
The National Credit Jewelers
Dept. E849 108 N. State St., Chicago, Ill.
Stores in: Chicago Pittsburgh St. Louis Omaha

Learn While

I can make a good penman of you at home during spare time. Write for my free book "How to Become a Good Penman." It contains specimens and tells how others mastered penmanship by the Tamblyn System. Your name will be elegantly written on a card if you enclose stamp to pay postage.

P. W. TAMBLYN, 410 Meyer Building, Kansas City, Mo.

Send for a Complete Catalogue of

MASONIC BOOKS. Jewelry and Goods

REDDING & CO.
Publishers and Manufacturers
Dept. R. 200 Fifth Avenue, New York

Red or Black **"Vulcan" Ink Pencils**

The ONLY perfect, non-leakable ink pencils at moderate prices.

Two Sizes, 4½ and 5½ ins.
Extra size, 8 inches (black only) $1.25.
FREE—liberal supply of ink with retail orders. *Agents Wanted. Big Profits.*

Order today $1

J. Z. ULLRICH & CO., 27 Thames St., New York

Send for Style Book and 64 Samples FREE

DO you know that you can get your suit or overcoat custom tailored to your measure in New York for many dollars less than you'd have to pay a local clothier for a ready-made suit of the same fabric?

Besides, we give you smarter, newer styles and finer tailoring than you could possibly get outside of New York.

We are able to make you a

$20 SUIT or Overcoat $13.50
TO YOUR MEASURE

because we sell you direct, maker to wearer, and eliminate agent and retail selling expenses.

Our handsomely illustrated catalog and 64 samples show you all the newest Fall and Winter styles, and explain our simple self-measuring system with which you can measure yourself as expertly as any tailor.

We guarantee to fit you from the measurements you send us and please you in every respect. You take no risk whatever.

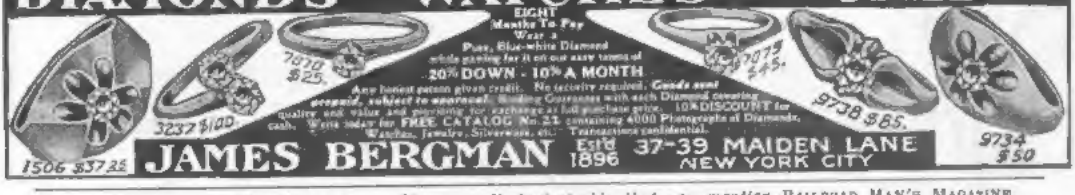
Send for FREE style book before you buy your Fall suit. It will show you how to save at least $6.50.

Bell Tailors of New York
Dept. L, 122 Walker St., New York City

$20 SUIT or Overcoat to Order $13.50

DIAMONDS — WATCHES ON CREDIT

EIGHT Months To Pay
Wear a Pure, Blue-white Diamond while paying for it on our easy terms of
20% DOWN - 10% A MONTH



Any honest person given credit. No security required. Goods sent prepaid, subject to approval. Binding Guarantee with each Diamond covering quality and value and providing for exchange at full purchase price. 10% DISCOUNT for cash. Write today for FREE CATALOG No. 21 containing 4000 Photographs of Diamonds, Watches, Jewelry, Silverware, etc. Transactions confidential.

JAMES BERGMAN Estd 1896 **37-39 MAIDEN LANE NEW YORK CITY**

RK

The Burlington SMASHES ALL WATCH PRICES

Look!

- ¶ 21 Ruby and Sapphire Jewels—
- ¶ Adjusted to the second—
- ¶ Adjusted to temperature—
- ¶ Adjusted to isochronism—
- ¶ Adjusted to positions—
- ¶ 25-year gold strata case—
- ¶ Genuine Montgomery Railroad Dial—
- ¶ New Ideas in Thin Cases.

Only $2.50 A Month

And all of this for $2.50—only $2.50 per month—a great reduction in watch prices—direct to you—positively the exact prices the wholesale dealer would have to pay. Think of the high-grade, guaranteed watch we offer here at such a remarkable price. And, if you wish, you may pay this price at the rate of $2.50 a month. Indeed, the days of exorbitant watch prices have passed.

See It First

You don't pay a cent to anybody until you see the watch. You don't buy a Burlington Watch without seeing it. Look at the splendid beauty of the watch itself. Thin model, handsomely shaped—aristocratic in every line. Then look at the works! There you will see the masterpiece of the watch makers' skill. A perfect timepiece adjusted to positions, temperature and isochronism.

Every fighting vessel in the U. S. Navy has the Burlington Watch aboard. This includes every torpedo boat—every submarine as well as the big Dreadnaughts.

Burlington Watch Co.
19th Street and Marshall Blvd.
Dept. 1097 Chicago, Ill.

Please send me (without obligation and prepaid) your free book on watches with full explanation of your cash or $2.50 a month offer on the Burlington Watch.

Name .....

Address .....

Send Your Name on This Free Coupon

Get the Burlington Watch Book by sending this coupon now. You will know a lot more about watch buying when you read it. You will be able to "steer clear" of the over-priced watches which are no better. Send the coupon today for the watch book and our offer.

Burlington Watch Co.
19th St. & Marshall Blvd., Dept. 1097, Chicago, Ill.